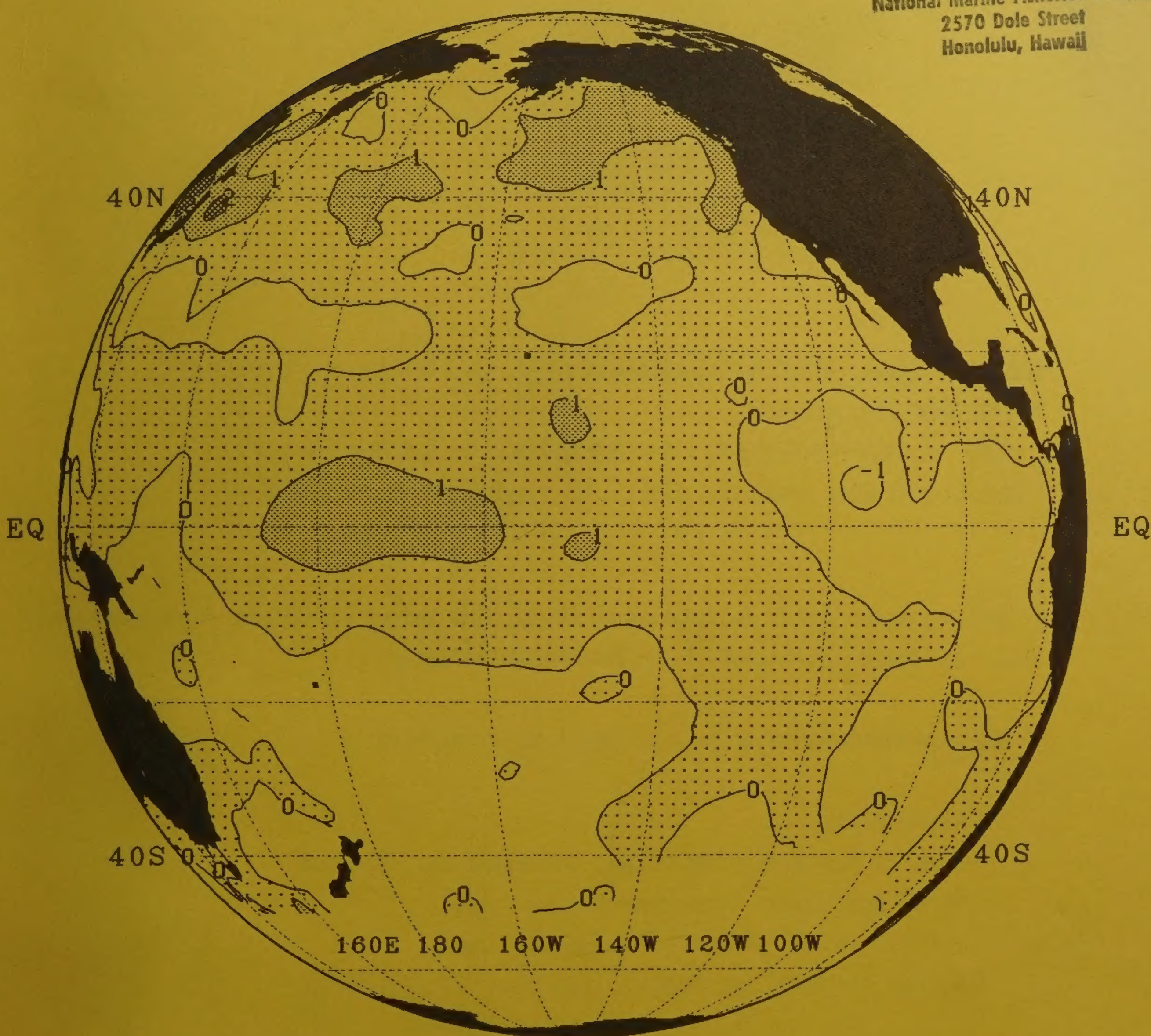
気　象　庁　海　洋　月　報

Monthly Ocean Report

August 1994 (No. 20)



El Niño Monitoring Center
Japan Meteorological Agency

気 象 庁 海 洋 気 象 部 海 洋 課
エ ル ニ ー ニ ョ 監 視 セ ン タ ー

平 成 6 年 8 月

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本月報に関する問い合わせは、

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表紙は1994年８月の太平洋の月平均海面水温偏差図です。
陰影部は平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for August 1994 in the Pacific Ocean.
Areas of positive anomalies are shaded.

Table of Contents

Figure Page

目　　次

Table of Contents

海況の特徴（１９９４年８月）

太平洋の海況

太平洋赤道域の海面水温は、170°Ｅから160°Ｗにかけてと150°Ｗ付近で平年より１℃以上高かった。一方、ペルーの沖合では平年より0.5℃以上低い状態が続いていた。エルニーニョ監視海域（4°Ｓ～4°Ｎ、150°Ｗ～90°Ｗ）の海面水温偏差は、0.0℃だった（第１表、第１図、第６図）。

赤道域表層の28℃以上の暖水層は、160°Ｗ以西で先月より厚さを増し、特に、日付変更線付近では100m以上に達した。ここでは、30℃以上の暖水が80mまで占めている（第３図）。

北太平洋では、40°Ｎ沿いの170°Ｅから170°Ｗにかけての海域とアラスカ湾沖では、平年より１℃高かった。一方、20°Ｎから30°Ｎの130°Ｅから170°Ｗにかけてとフィリピンの北東では平年より低かった（第１図）。

日本近海の海況

日本近海は、南西諸島周辺で平年より低いほかは、全般に平年より0.5～2℃高く、特に、本州東方と日本海では平年より2℃以上高かった（第17図）。

今夏の日本近海の海面水温は記録的に高かった（詳細については、iiiページを参照）。

黒潮は日本の南岸に沿ってほぼ直進し、房総半島沖を東に流れていた（第20図）。

本州東方の親潮系の冷水（深さ100ｍで5℃以下）は、沿岸寄りの分枝は39.5°Ｎ・144.0°Ｅまで、沖合の分枝は39.3°Ｎ・149.0°Ｅまで、それぞれ達していた（第19図）。

熱帯の気象

西部熱帯太平洋の対流活動は弱く、フィリピン付近の上層雲量指数は-0.9であった。一方、日付変更線付近の赤道から20°Ｓにかけての対流活動は平年よりかなり強かった。太平洋赤道上の下層東西風は、西部で西風偏差が、東部で東風偏差が強まった。南方振動指数（ＳＯＩ）は-1.8と大きな負の値が今月も継続した（第１表、第12図、第13図）。

［気象庁長期予報課提供］

HIGHLIGHTS August 1994

Pacific

Sea surface temperatures (SSTs) in the equatorial Pacific were more than 1°C above normal between 170°E and 160°W and around 150°W. SSTs continued to be more than 0.5°C below normal off Peru. The SST index for region B (Fig. 6) was 0.0°C (Table 1 and Figs. 1 and 6).

The thickness of surface warm water (above 28°C) along the equator has increased west of 160°W since last month and exceeded 100 m near the date line. The thickness of water exceeding 30°C reached about 80 m near the date line (Fig. 3).

In the North Pacific, SSTs were more than 1°C above normal along 40°N from 170°E to 170°W and off the Gulf of Alaska. SSTs between 20°N and 30°N from 130°E to 170°W and in seas adjacent to the Philippines were below normal (Fig. 1).

Seas adjacent to Japan

SSTs in the seas adjacent to Japan were 0.5-2°C above normal except around the Nansei Islands. SSTs were notably more than 2°C above normal east of Honshu and in the Japan Sea (Fig. 17).

Positive SST anomalies prevailed in seas adjacent to Japan in this summer (sea page iii for details).

The Kuroshio flowed straight along the south coast of Japan, then flowed eastward off the Boso Peninsula (Fig. 20).

The Oyashio cold water (below 5°C at a 100 m depth) extended southward to 39.5°N, 144.0°E and 39.3°N, 149.0°E, respectively (Fig. 19).

Atmospheric conditions in the tropics

Convective activity over the northwestern tropical Pacific was weaker than normal, especially around the Philippines, where enhanced convection had been observed during July. The activity of SPCZ west of the date line was considerably stronger than normal. At 850 hPa height, westerly anomalies enhanced over the western equatorial Pacific and easterly anomalies enhanced over the eastern equatorial Pacific. The SOI has continued to have a large negative value (-1.8) (Table 1 and Figs. 12 and 13).

[prepared by the Long-range Forecast Division, JMA]

今夏の日本近海の海面水温は記録的に高かった。７月には東シナ海及び日本の南で、８月には日本海南部及び本州東方で、各月の海域平均海面水温は1949年以降、最も高い値となった（表Ａ）。

Positive SST anomalies prevailed in seas adjacent to Japan this summer. Regional monthly mean SSTs recorded the highest values since 1949 in the East China Sea and south of Japan in July and in the southern part of the Japan Sea and east of Honshu in August (Table A).

Region	Month	Rank	Year	Temperature (℃)
The East China Sea 26- 30°N 120-130°E	July	1	1994	29.0
		2	1988	28.8
		3	1961, 78	28.6
		5	1971, 77, 80, 91	28.5
		Normal		27.9
South of Japan 30- 34°N 130-140°E	July	1	1994	27.8
		1	1961	27.8
		3	1984	27.5
		4	1956, 63, 78, 81	27.4
		Normal		26.5
Southern part of the Japan Sea 36- 40°N 130-140°E	August	1	1994	27.2
		1	1967	27.2
		3	1985	27.0
		4	1950, 78	26.7
		Normal		25.2
East of Honshu 36- 40°N 140-150°E	August	1	1994	26.2
		1	1950	26.2
		3	1984	25.8
		4	1951	25.6
		5	1955	25.3
		Normal		24.1

表　Ａ　日本近海の各海域の高い月平均海面水温の順位（1949年以降、平年値は1961年から1990年の平均）

Table A　Ranking of high monthly mean SSTs in seas adjacent to Japan since 1949. Normals are the 30-year averages from 1961 to 1990.

Date		1993									1994								
		MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Pacific Sea Surface Temperature (℃)																			
D	(14N～ Eq.)	28.2	28.6	28.8	29.2	29.1	28.9	29.1	29.1	29.5	29.1	28.4	28.5	28.6	29.1	29.4	29.6	29.2	29.3
	(130E～150E)	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	-0.2	+0.3	+0.2	-0.1	+0.2	+0.2	+0.3	+0.3	+0.3	0.0	+0.2
A	(4N～ 4S)	28.4	28.7	29.0	29.1	29.1	28.8	29.1	28.8	28.9	28.7	28.2	28.0	28.2	28.4	28.9	29.0	29.2	29.4
	(160E～150W)	+0.3	+0.5	+0.5	+0.6	+0.6	+0.4	+0.8	+0.4	+0.5	+0.5	+0.2	0.0	+0.1	+0.2	+0.4	+0.5	+0.7	+1.0
B	(4N～ 4S)	27.4	28.1	28.0	27.0	25.8	24.9	24.8	25.0	25.2	25.3	25.7	26.1	26.9	27.0	26.8	26.3	25.1	24.6
	(150W～ 90W)	+0.5	+1.0	+1.4	+0.9	+0.6	+0.3	+0.2	+0.4	+0.6	+0.4	+0.3	-0.1	0.0	-0.1	+0.2	+0.2	-0.1	0.0
C	(Eq. ～ 10S)	27.0	26.4	25.2	23.3	22.1	21.0	20.8	21.3	21.5	22.8	24.7	26.0	25.3	24.2	23.4	22.2	21.2	20.6
	(90W～ 80W)	+1.1	+1.3	+1.3	+0.6	+0.5	+0.4	+0.5	+0.6	0.0	+0.2	+0.4	+0.3	-0.6	-0.9	-0.5	-0.5	-0.4	0.0
Pacific Sea Level Anomaly (cm)																			
YAP	(10N, 138E)	11	1	-2	-2	1	-1	5	8	8	10	7	7	6	2	2	7	8	
RABAUL	(4S, 152E)	-14	-12	-13	-11	-8	-9	-7	-6	-5	-2	-1	3	4	5	3	1	2	
MAJURO	(7N, 171E)	-4	-8	-1	6	5	3	1	5	2	3	2	2	3	5	1	-2	-1	
TARAWA	(1N, 173E)	10	3	5	6	4	7	4	6	2	1	6	-1	6	6	7	6	9	
CHRISTMAS	(2N, 157W)	8	6	5	-1	-2	-1	-1	-2	-1	-7	-3	-7	0	0	1	1	4	
SANTA CRUZ	(1S, 90W)	7	7	10	4	0	0	1	3	0	0	-1	0	-4	-8	-3	1	0	

第1表（a）エルニーニョ監視指数

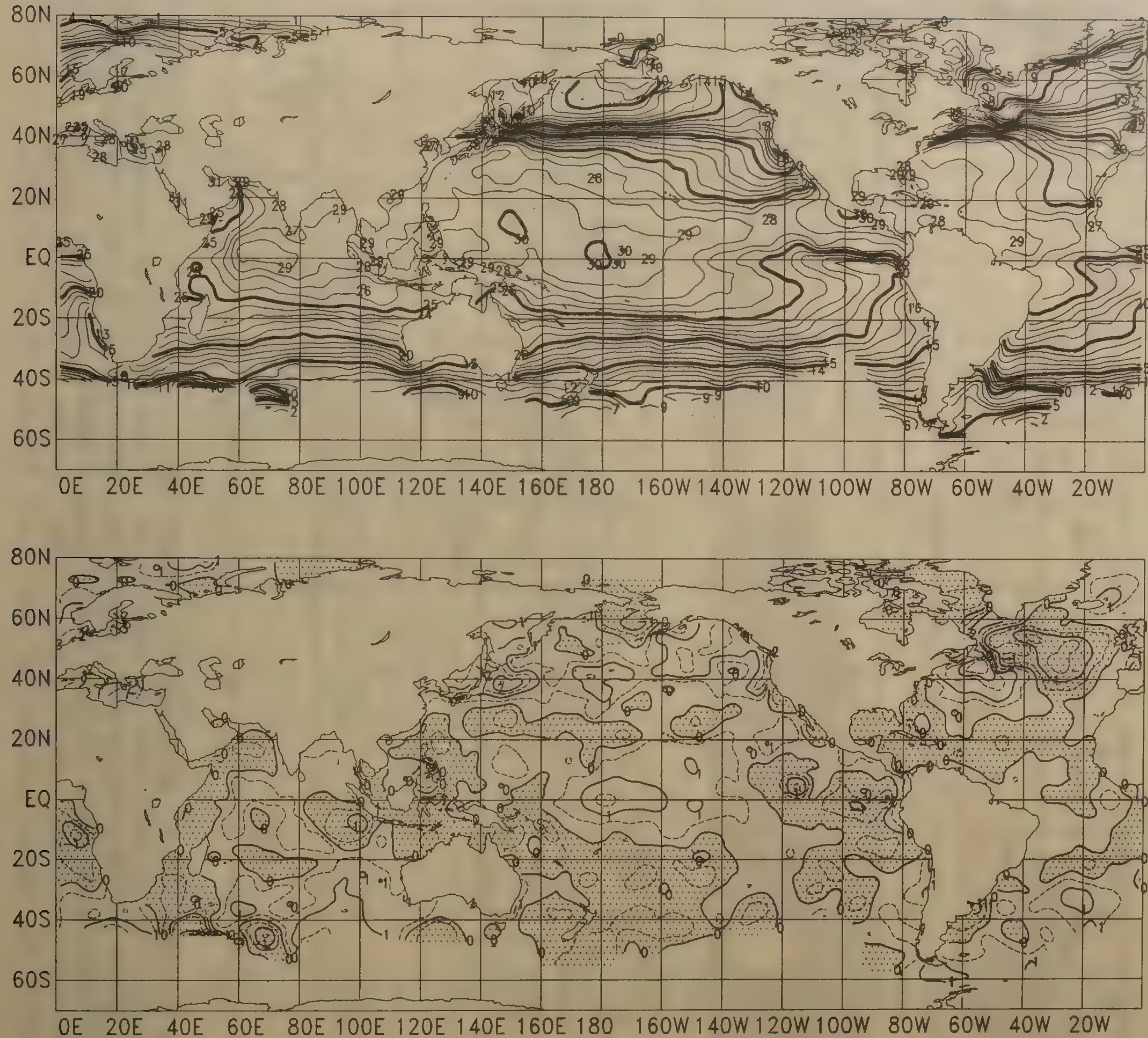
Table 1(a) El Niño monitoring indices. Data sources are the El Niño Monitoring Center, JMA for the sea surface temperature and the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii for the sea level anomaly.

Date		1993									1994								
		MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Southern Oscillation Index																			
SOI	(TAHITI-DARWIN)	-0.5	-1.9	-0.8	-1.6	-1.0	-1.5	-0.7	-1.4	-0.0	0.2	-0.2	0.1	-0.8	-2.1	-1.4	-1.0	-1.6	-1.8
TAHITI	(17.5S, 150W)	1.0	-0.7	0.2	-0.6	-1.1	0.0	-0.0	-0.9	0.1	-0.0	-0.1	0.0	-0.1	-1.5	-0.8	-0.9	-1.5	-0.7
DARWIN	(12.5S, 131E)	2.4	1.9	1.4	1.3	0.4	2.2	1.4	1.3	0.1	-0.5	0.3	-0.2	1.7	1.2	1.0	0.3	1.0	2.0
High Cloud Amount Index																			
HCLD-PH	(20N ~ 10N) (110E ~ 140E)	-0.4	-0.5	-2.2	-1.9	-0.5	-0.4	0.7	-0.1	-0.6	1.2	-0.5	-0.5	0.6	0.7	0.2	-0.3	3.5	-0.9
HCLD-MC	(5N ~ 5S) (110E ~ 135E)	-1.1	0.3	-1.4	-2.1	-1.0	-1.4	-1.0	-1.5	-0.8	-0.2	-0.4	-0.5	0.8	0.4	0.4	-1.0	-1.1	-1.1
HCLD-DL	(5N ~ 5S) (170E ~ 170W)	0.5	2.8	2.0	1.8	1.3	0.3	1.8	1.7	-0.2	0.0	0.0	-0.7	-0.6	0.4	-0.3	-0.3	-0.5	0.4
Equatorial Zonal Wind Index																			
U200-IN	(5N ~ 5S) (80E ~ 100E)	-0.9	-0.3	0.5	0.4	-0.3	-0.5	-2.1	-0.7	-0.8	-1.8	-0.4	-0.8	-1.5	-0.2	-0.3	-0.5	-1.2	-0.6
U200-CP	(5N ~ 5S) (180 ~ 125W)	0.0	-0.6	-1.3	-0.0	1.1	0.3	-0.3	0.0	-0.5	0.4	0.4	0.8	0.2	-0.3	-0.5	-0.7	0.4	0.0
U850-WP	(5N ~ 5S) (160E ~ 175W)	0.3	0.8	0.5	0.3	0.1	0.7	-0.0	0.9	-0.4	-0.7	-1.2	-1.0	-0.6	-0.5	-0.3	-0.4	0.1	0.6
U850-CP	(5N ~ 5S) (170W ~ 135W)	-0.1	0.3	0.6	0.6	-0.8	0.1	0.2	0.4	0.3	-0.5	-0.6	-0.9	-0.2	-0.4	0.2	-0.6	-0.1	0.0
U850-EP	(5N ~ 5S) (130W ~ 100W)	0.2	0.5	0.9	0.7	-0.4	0.8	1.0	0.2	0.9	0.2	0.1	-0.4	0.1	-0.5	0.0	-0.5	-1.3	-1.8

第1表（b）エルニーニョ監視指数(続き)

Table 1(b) El Niño monitoring indices (continued).
Data source for these atmospheric conditions is the Long-range Forecast Division, JMA.

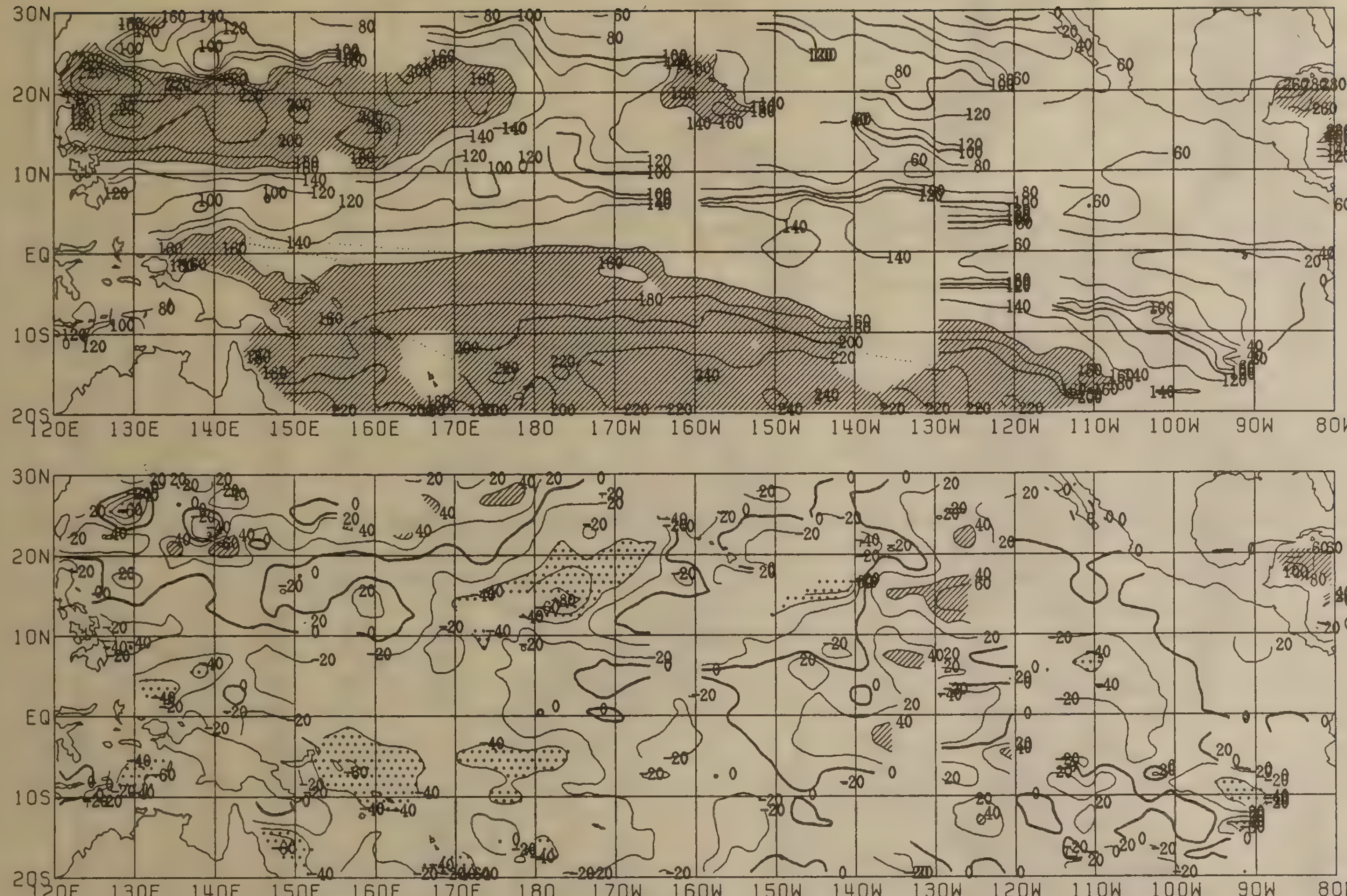
SST & Anomalies in the Global Ocean



第１図　全球月平均海面水温図（上）及び偏差図（下）（1994年 8月）

Fig.1 Monthly mean sea surface temperature in the global ocean (top) and anomalies (bottom) for AUG 1994. Anomalies are computed with respect to the JMA climatology (1961−90) (Climatic charts of sea surface temperatures of the western North Pacific and the global ocean, March 1991). The Contour interval is 1° C and additional anomaly contours of ±0.5° C are shown as broken lines. Negative anomalies are stippled.

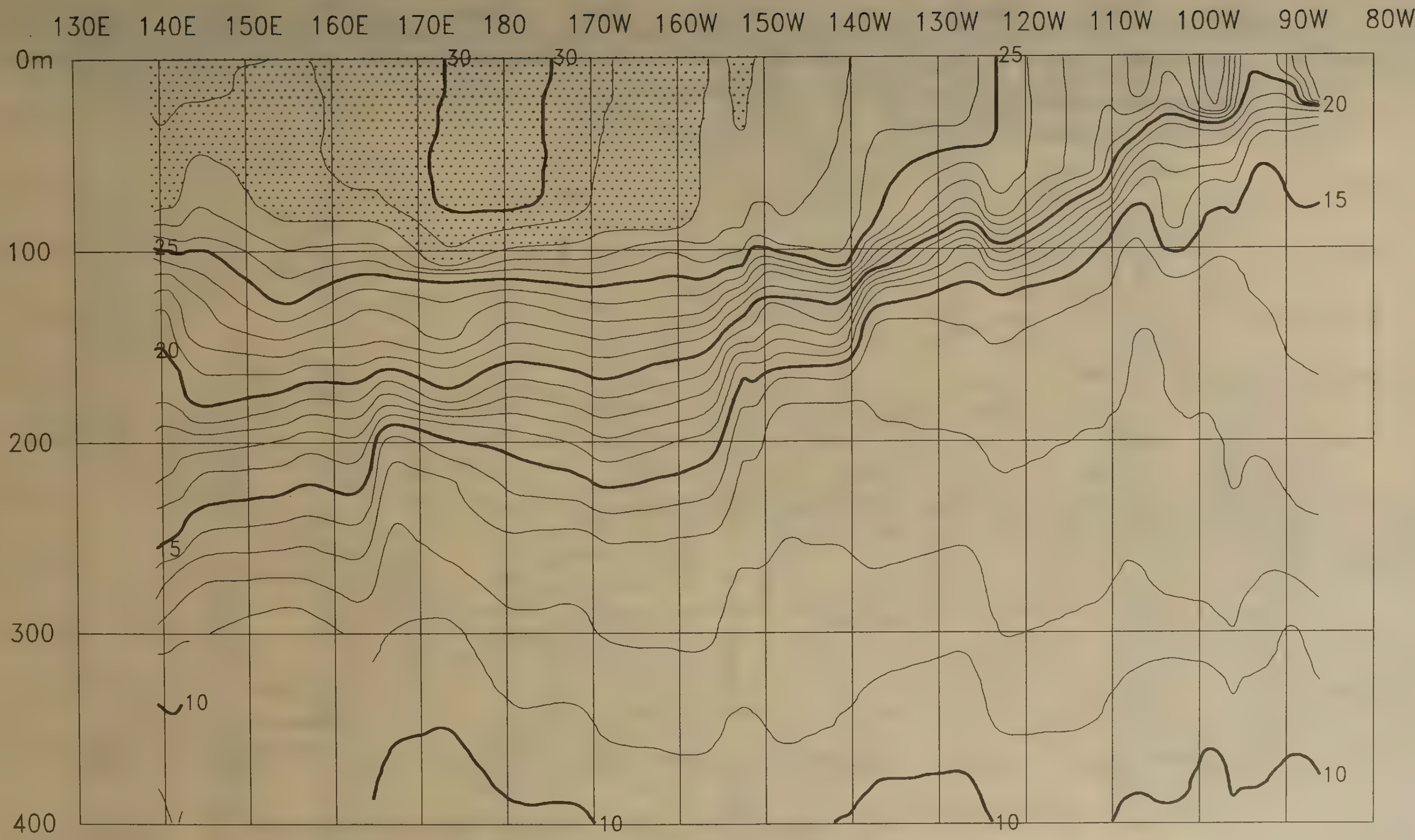
Depth of 20° C & Anomalies in the Pacific Ocean



第２図　太平洋表層水温（20℃深度）図（上）及び偏差図（下）（1994年 8月）

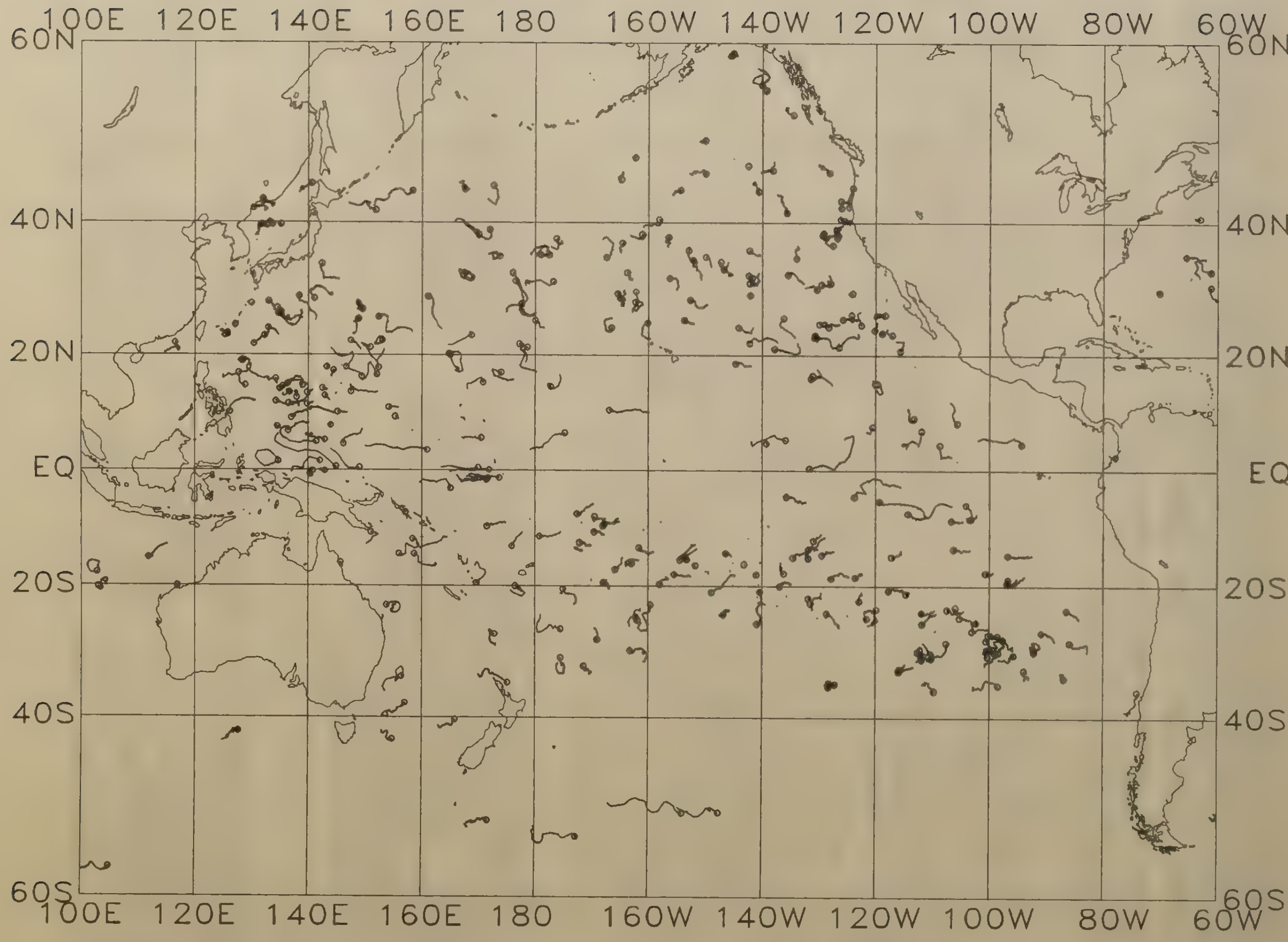
Fig.2 The depth of a 20° C isotherm in the Pacific Ocean (top) and anomalies (bottom) for AUG 1994. Anomalies are computed with respect to the climatology (Levitus, 1982, Climatological Atlas of the World Ocean, NOAA).
The contour interval is 20m with shading for values greater than 160m (top), and shading/stippling for values greater/smaller than +40m/−40m (bottom).

Depth–Longitude Section of Ocean Temperature



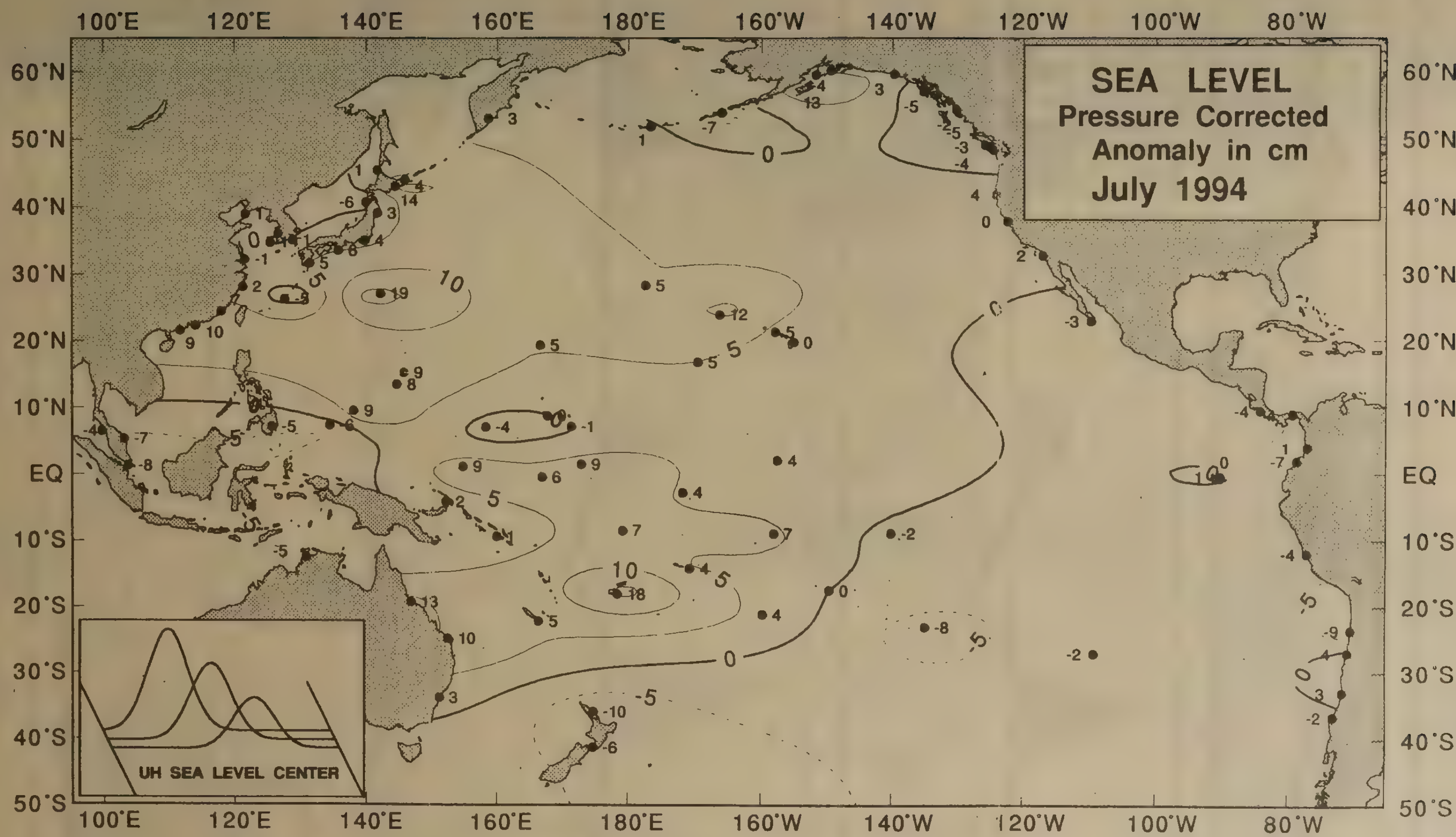
第３図　太平洋赤道に沿う表層水温断面図（1994年 8月）

Fig.3 Depth–longitude section of the Pacific Ocean temperature along the equator for AUG 1994. The contour interval is 1°C with spotted shading for values greater than 28°C.



第4図　太平洋ブイ流跡図(1994年 8月)

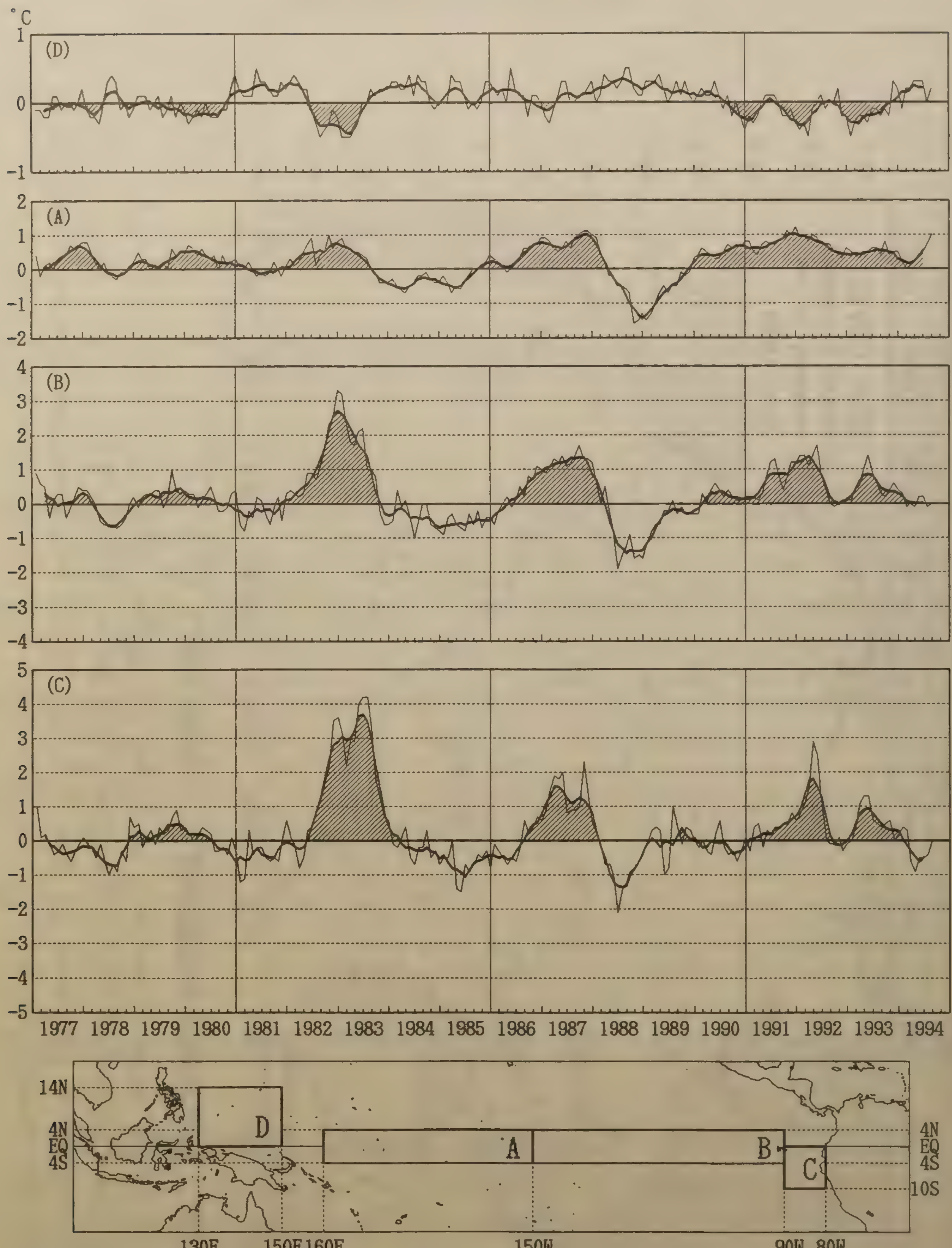
Fig.4 Movements of drifting buoys in the Pacific Ocean during AUG 1994. Each track is one buoy, with the small circle representing the buoy's last position for the month.



第5図　太平洋海面水位偏差図（ 1994年 7月 ）

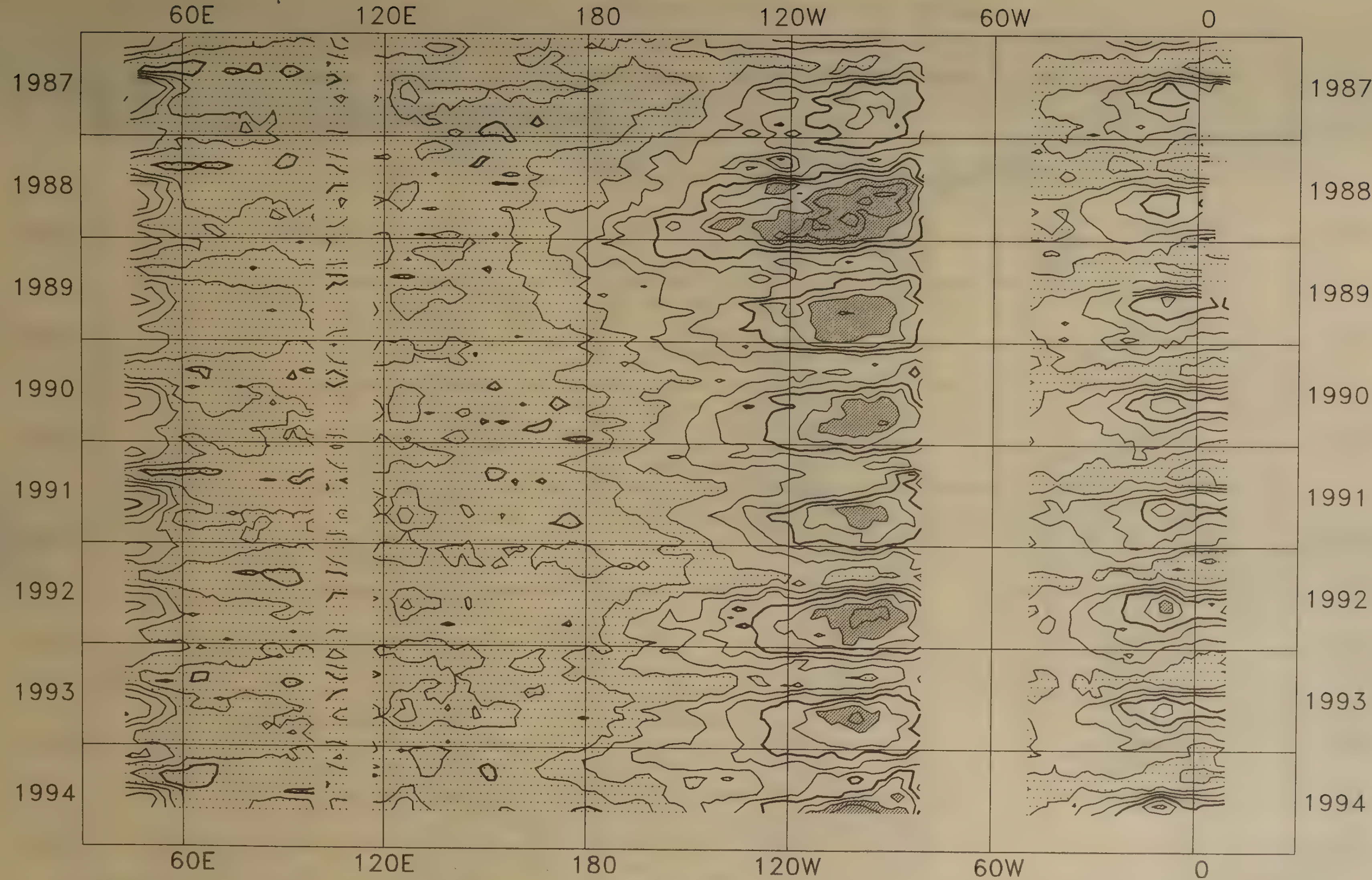
Fig.5　Sea level anomalies obtained from the 1975 to 1986 mean JUL sea level adjusted for atmospheric pressure (JUL 1994).
This figure is prepared by the SOC of ISLP−PAC, Dept. of Oceanography, Univ. of Hawaii.

Time Series of Equatorial Pacific SST Anomalies



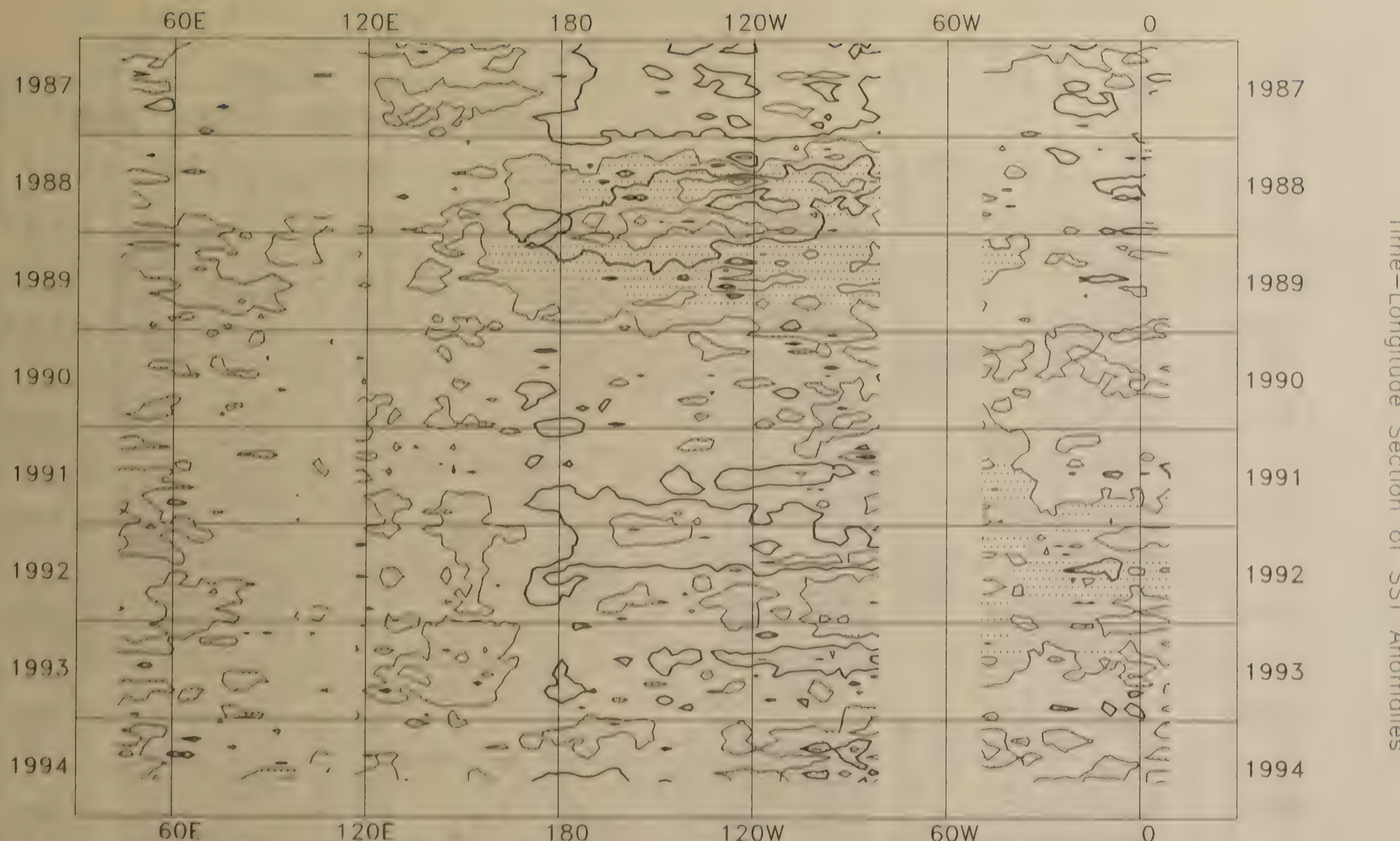
第６図　赤道太平洋海面水温偏差時系列図

Fig.6 Time series of monthly mean SST anomalies in the equotorial Pacific Ocean for the areas indicated at the bottom of the figure. Thin lines show the monthly values and thick lines their 5 month running mean. Positve anomalies (A,B,C) and negative anomalies (D) are shaded. Anomalies are computed with respect to the JMA climatology (1961–90).



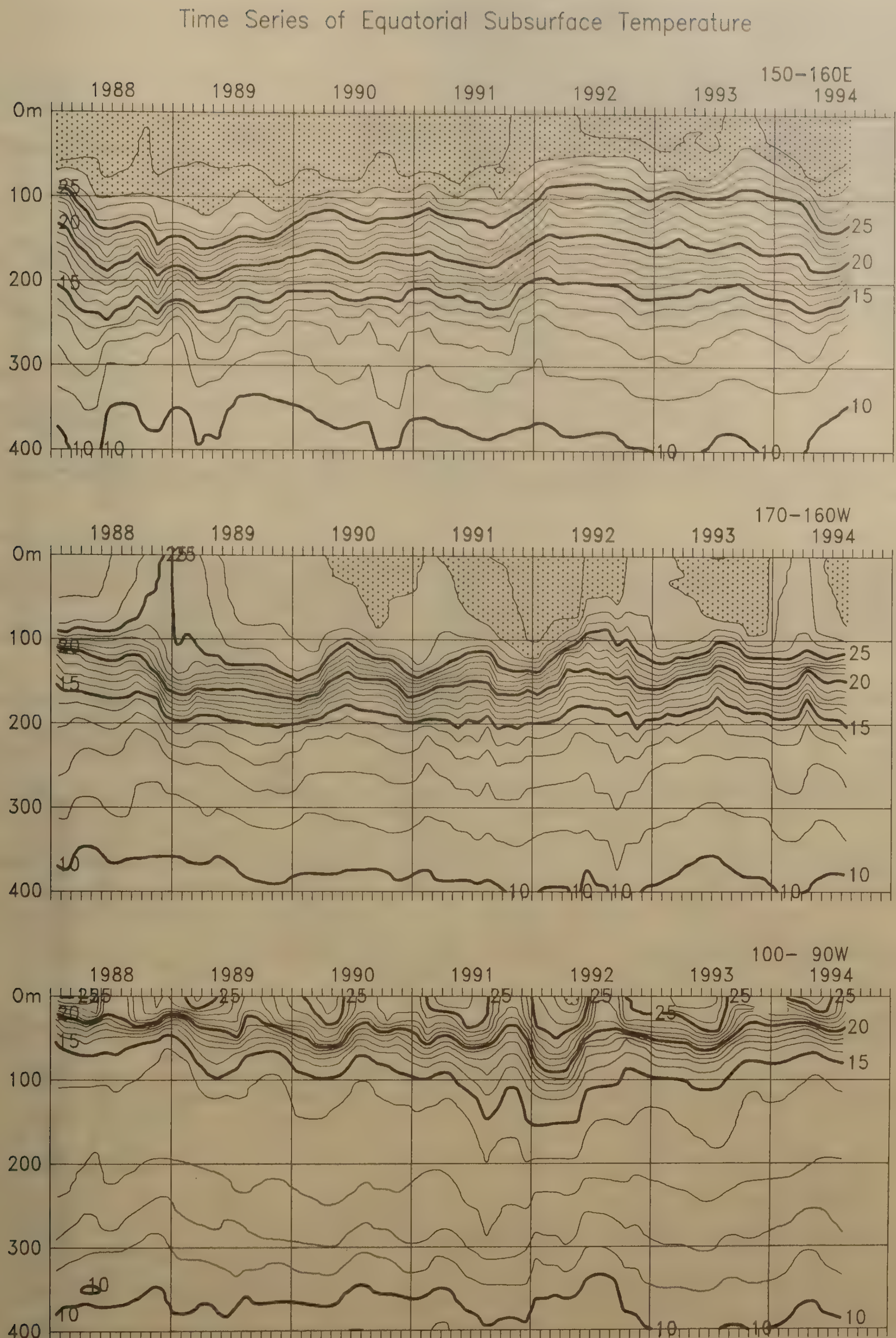
第7図　赤道に沿う海面水温時系列図

Fig.7 Time–longitude section of SSTs along the equator (2° N–2° S) in the global ocean. The contour interval is 1° C, with thick contour lines at 25 and 30° C. SST values greater than 28° C are spotted and values less than 23° C are shaded.



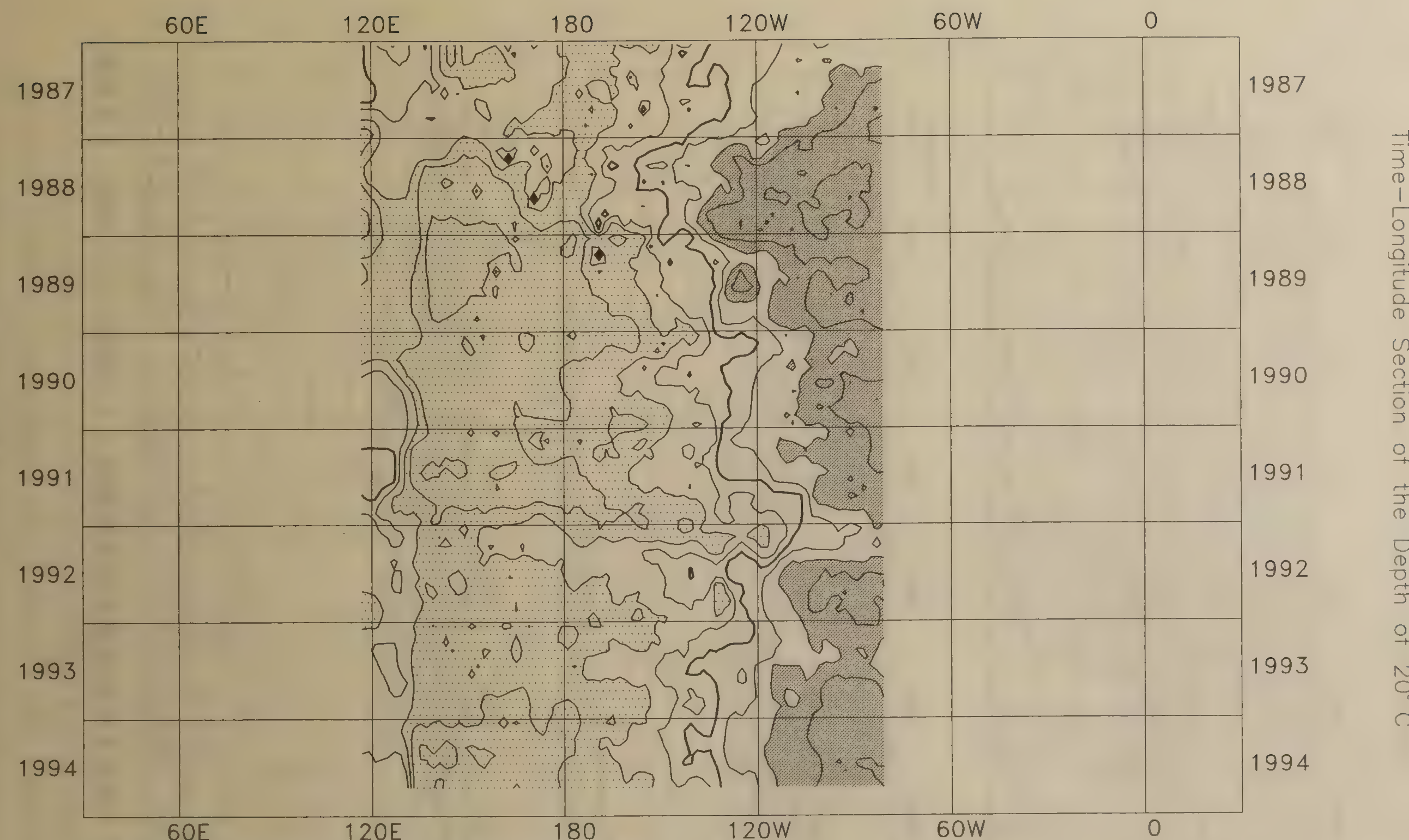
第8図　赤道に沿う海面水温偏差時系列図

Fig.8 Time-longitude section of SST anomalies along the equator (2° N–2° S) based on the JMA climatology (1961–1990). The contour interval is 1° C, with thick contour lines at +1° C and −1° C. Negative anomalies are spotted.



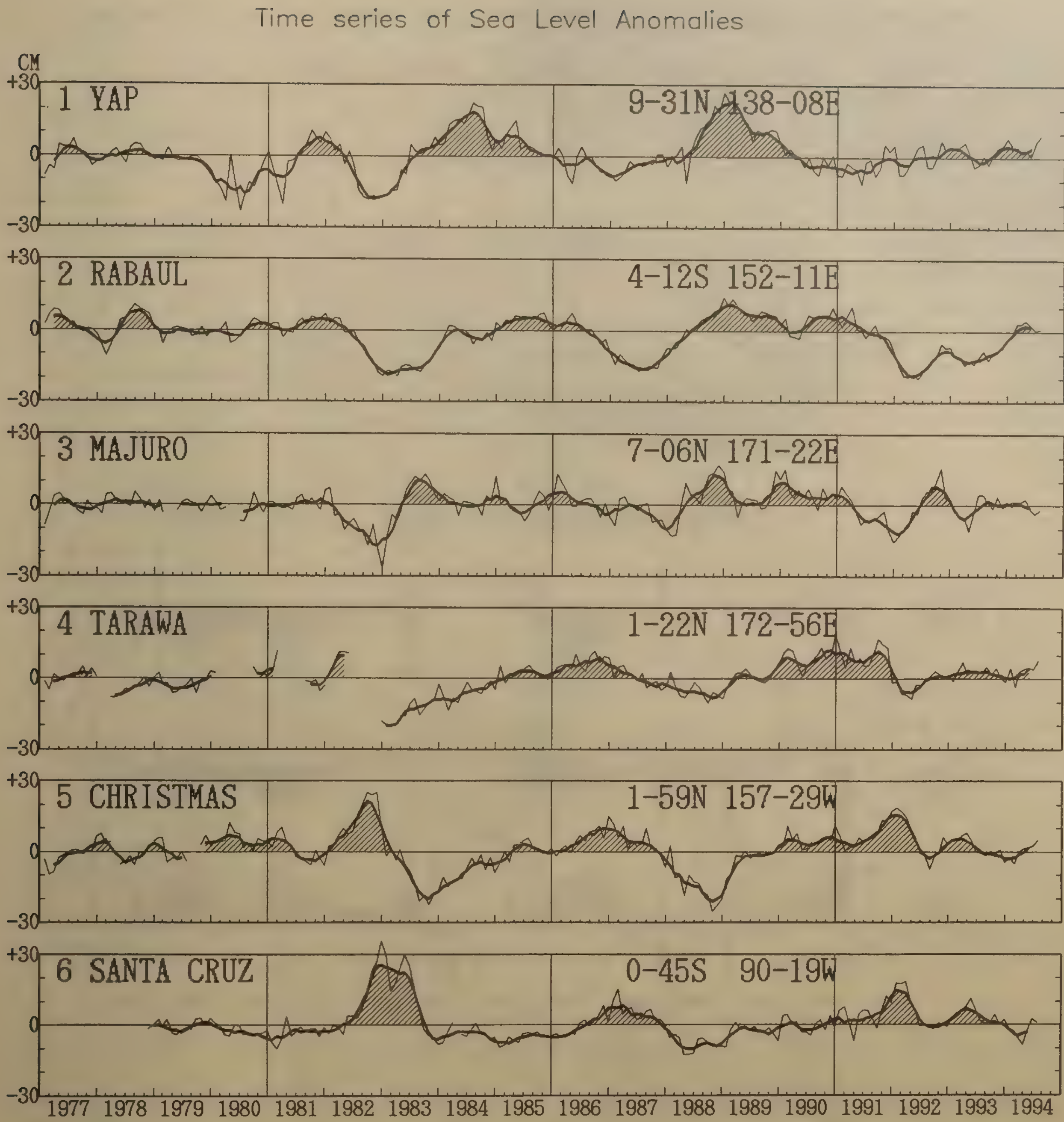
第９図　赤道太平洋表層水温時系列図（上：西部、中：中部、下：東部）

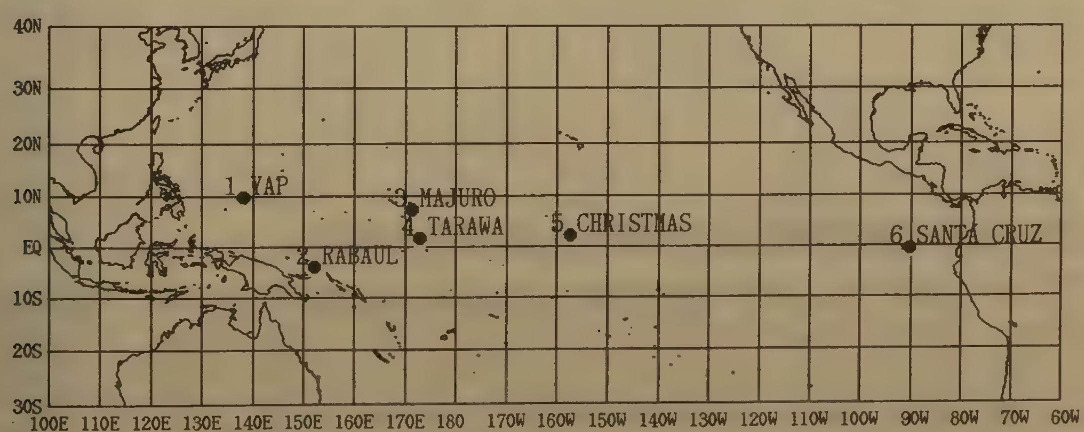
Fig.9 Time series of equatorial (2° N–2° S) subsurface temperature for the western Pacific (top, 150–160° E), the central Pacific (middle, 170–160° W) and the eastern Pacific (bottom, 100–90° W). The contour interval is 1° C with spotted shading for the values greater than 28° C.



第10図　太平洋の赤道に沿う20℃深度時系列図

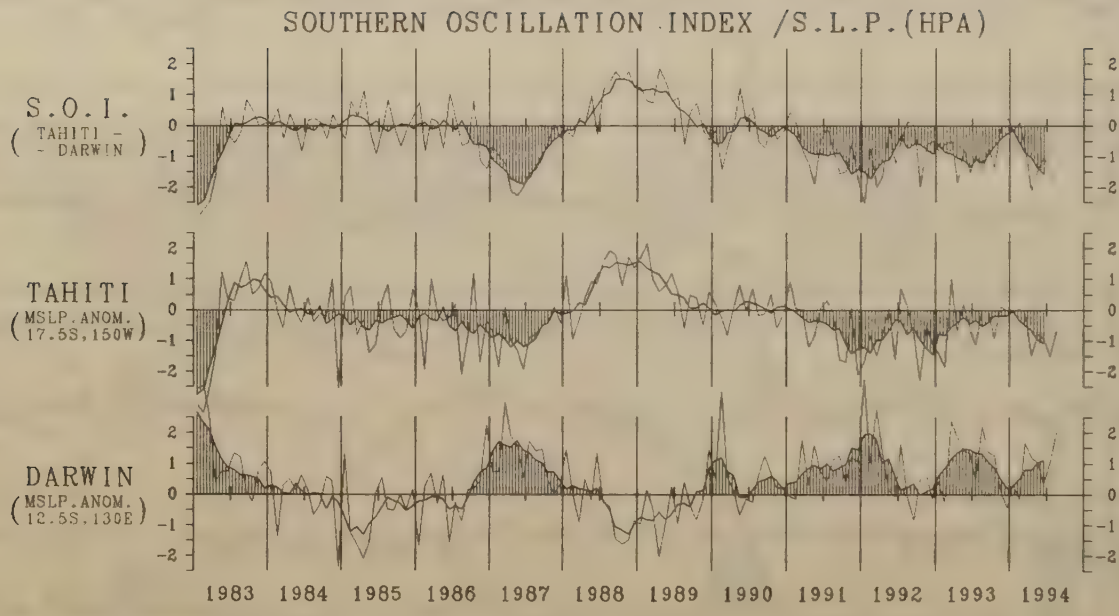
Fig.10 Time-longitude section of the depth of a 20° C isotherm along the equator in the Pacific Ocean. The contour interval is 20m with thick contour lines at 100m. Values shallower than 60m are shaded and those deeper than 140m are stippled.





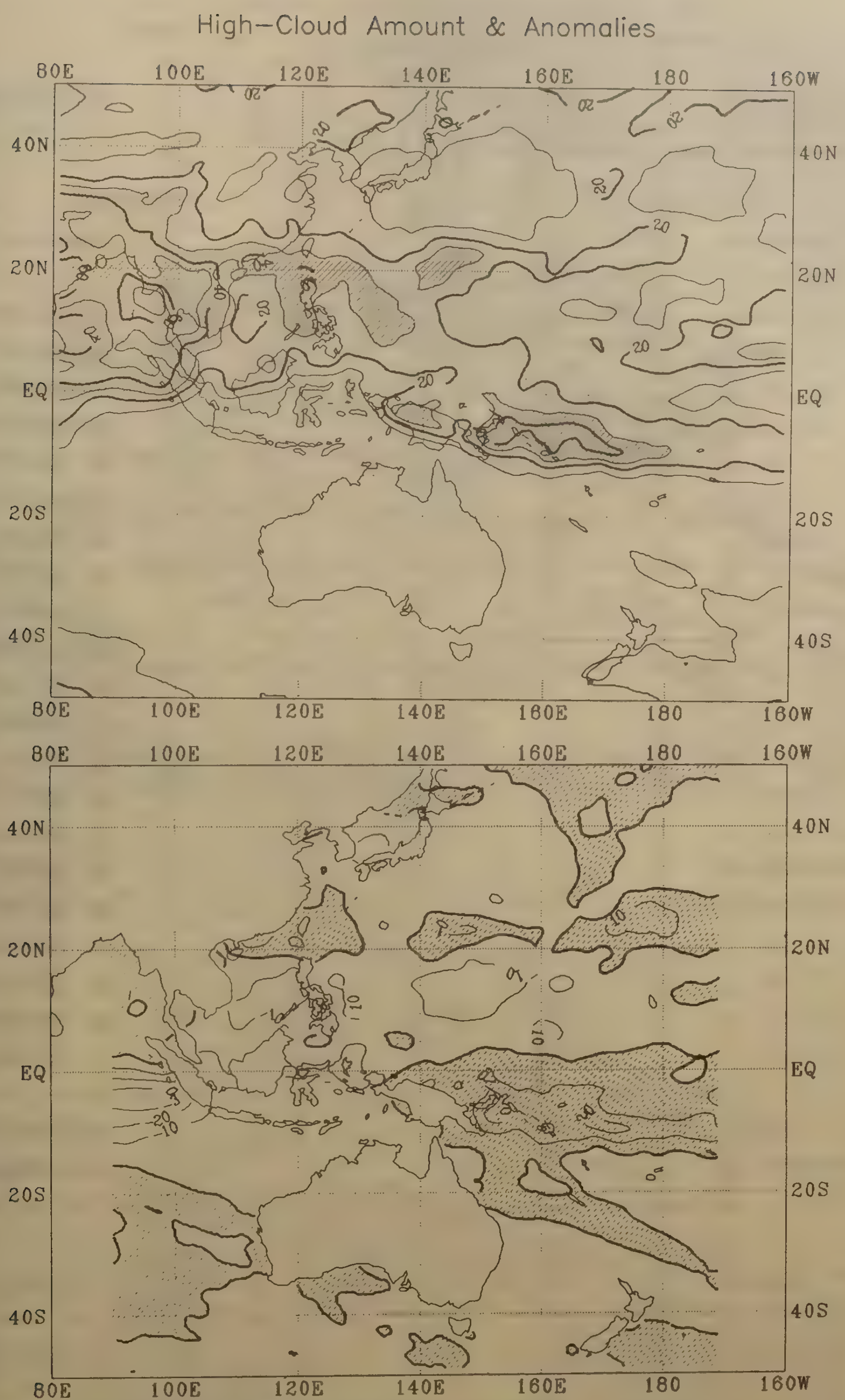
第11図　太平洋月平均海面水位偏差時系列図

Fig.11 Time series of sea level anomalies based on 1976 to 1990 monthly mean sea level obtained from the stations indicated at the bottom of the figure. Thin lines show the monthly mean and thick lines show their 5 month running mean. Positive anomalies are shaded.



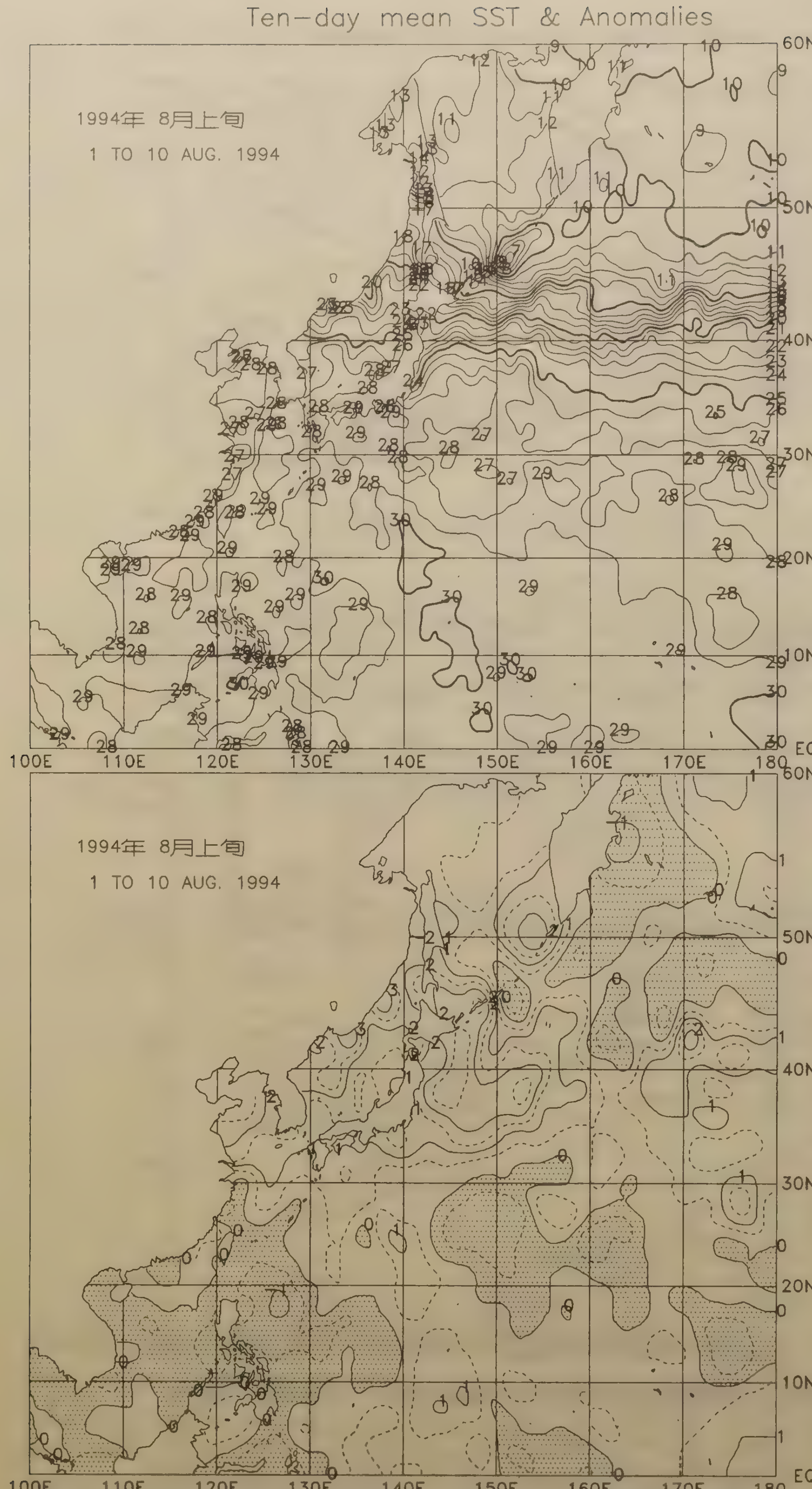
第12図　南方振動指数及び海面気圧偏差時系列図

Fig.12 The Southern Oscillation Index (top) and monthly mean sea level pressure standardized anomalies at Tahiti (middle) and Darwin (bottom). Thin lines show the monthly mean and thick lines their 5 month running mean. Negative values (top, middle) and positive values (bottom) are shaded. Base periods for normals and standard deviations are 1961–1990. This figure is prepared by the Long-range Forecast Division, JMA.



第13図　月平均上層雲量分布図及び偏差図（1994年 8月）

Fig.13 Monthly mean of the high-cloud amount (%, top) and its anomalies (%, bottom) in the equatorial Pacific for AUG 1994. The contour interval is 10%. Areas above 30% are shaded (top) and positive anomalies are stippled (bottom). Anomalies represent a departure from the 1978–1990 base period monthly means. This figure is prepared by the Long-range Forecast Division, JMA.



旬平均沿岸水温(℃)
Coastal Water Temperature

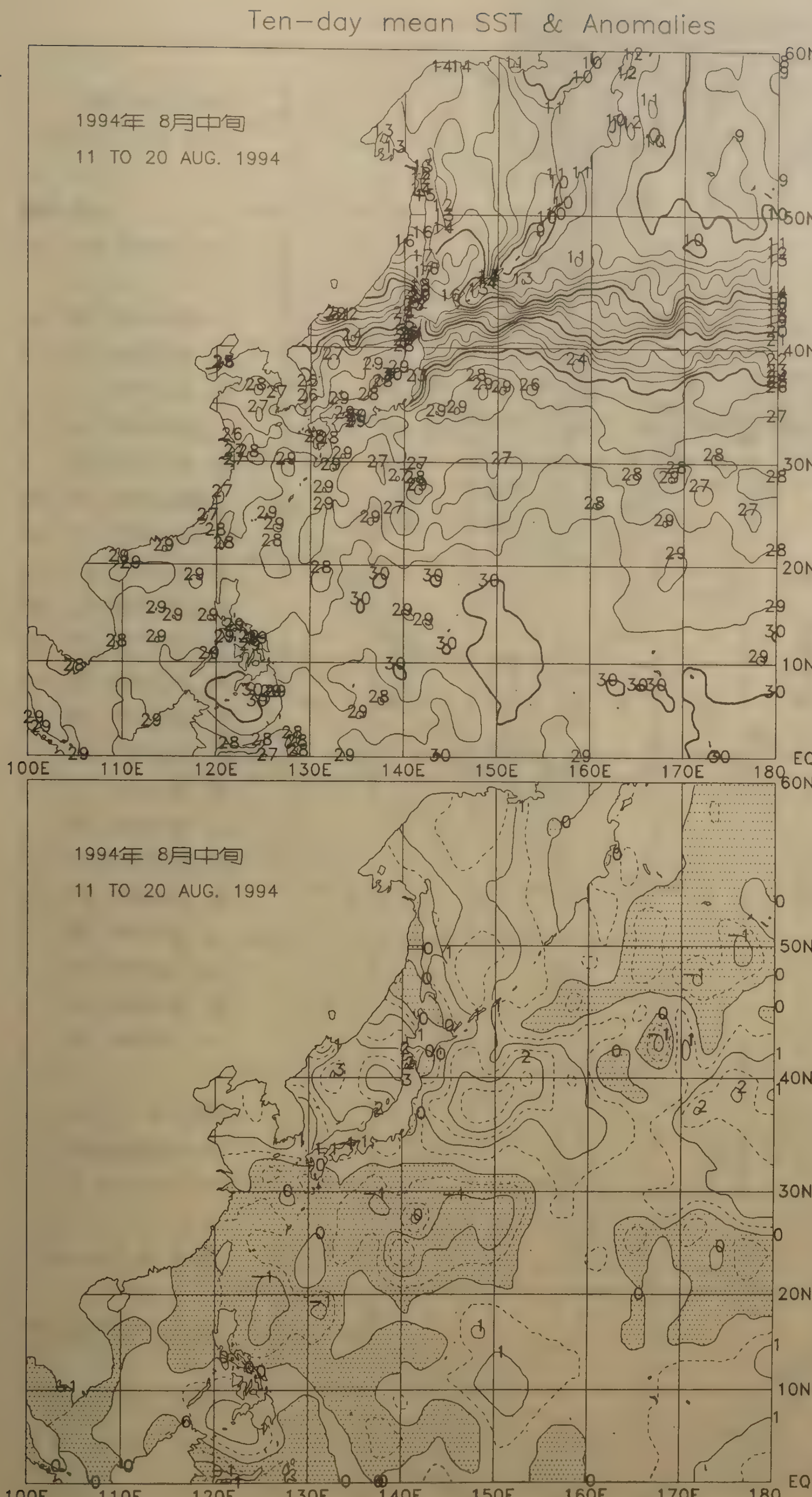
地名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	29.4	+0.3
那　覇(47936)	29.1	+0.8
名　瀬(47909)	-	-
足摺岬(47898)	27.8	+1.0
潮　岬(47778)	29.3	-
御前崎(47655)	27.6	+1.7
八丈島(47678)	26.9	+0.2
館　山(47672)	24.7	+0.9
小名浜(47598)	22.9	+2.5
宮　古(47585)	20.5	+1.9
浦　河(47426)	17.4	-0.9
紋　別(47435)	20.0	-
稚　内(47401)	21.0	-
寿　都(47421)	23.4	-
江　差(47428)	24.3	-
飛　島(47587)	25.6	+0.1
輪　島(47600)	28.5	+1.9
西　郷(47740)	27.4	-
浜　田(47755)	29.0	-
厳　原(47800)	27.5	-
牛　深(47838)	27.5	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	26.7
四国沖	29.0N,135.0E	29.2
東シナ海	28.2N,126.3E	29.9

第14図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 8月上旬)

Fig.14 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 1st ten-day period in AUG 1994. Anomalies are computed with respect to the JMA climatology (1961-90). The contour interval is 1°C and additional anomaly contours of 0.5°C are shown. Negative anomalies are stippled.



旬平均沿岸水温(℃)
Coastal Water Temperature

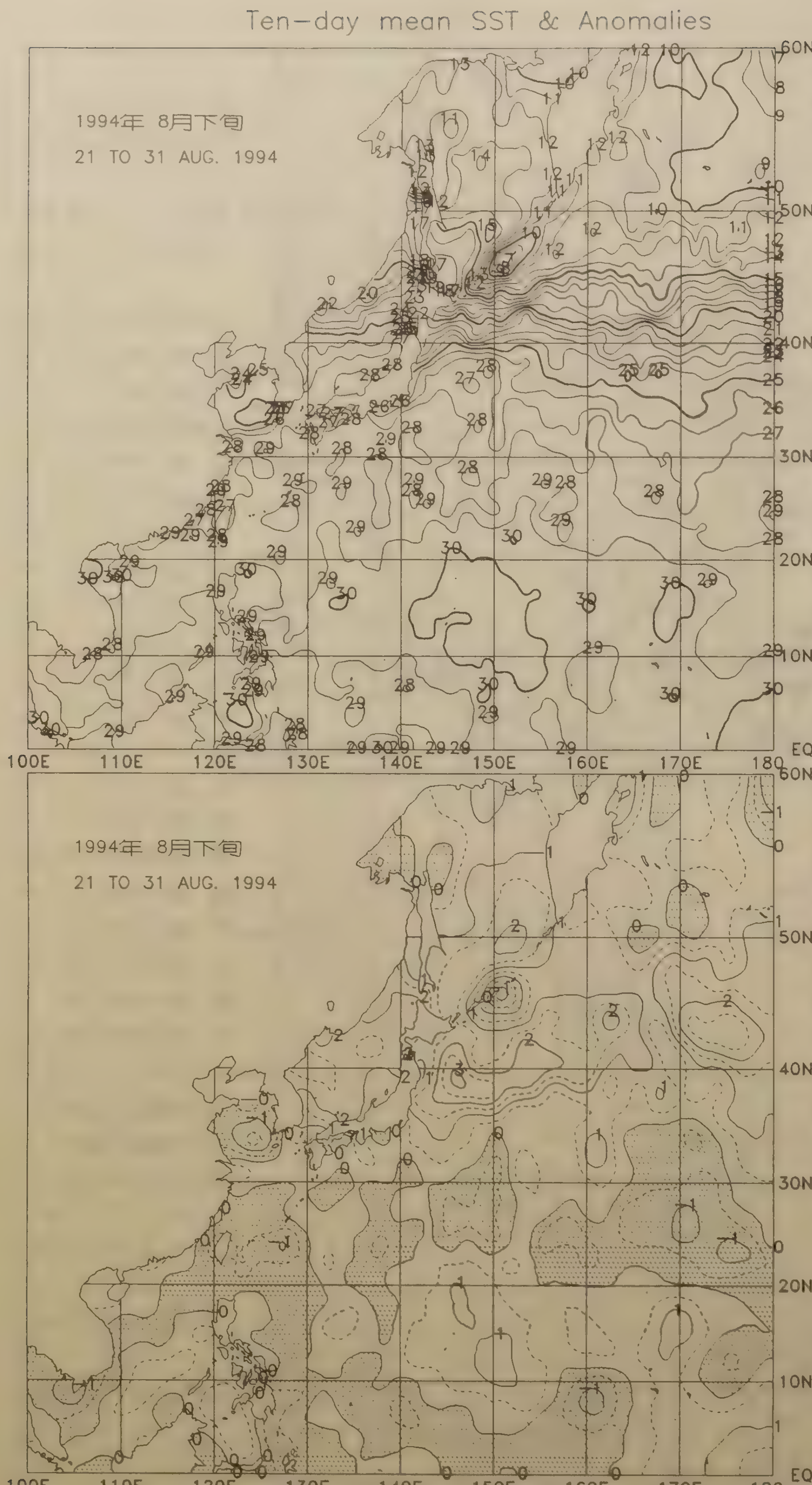
地名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	28.2	−0.7
那覇(47936)	28.5	+0.4
名瀬(47909)	−	−
足摺岬(47898)	28.4	+1.3
潮岬(47778)	29.0	−
御前崎(47655)	28.4	+1.9
八丈島(47678)	27.7	+0.6
館山(47672)	23.5	−0.8
小名浜(47598)	21.6	+0.2
宮古(47585)	21.2	+1.7
浦河(47426)	20.3	+1.4
紋別(47435)	20.9	−
稚内(47401)	21.5	−
寿都(47421)	−	−
江差(47428)	24.7	−
飛島(47587)	27.6	+1.8
輪島(47600)	29.7	+2.8
西郷(47740)	28.4	−
浜田(47755)	28.9	−
厳原(47800)	27.6	−
牛深(47838)	28.0	−

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	27.9
四国沖	29.0N,135.0E	26.9
東シナ海	28.2N,126.3E	28.8

第15図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 8月中旬)

Fig.15 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 2nd ten-day period in AUG 1994. Anomalies are computed with respect to the JMA climatology (1961−90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.



旬平均沿岸水温(℃)
Coastal Water Temperature

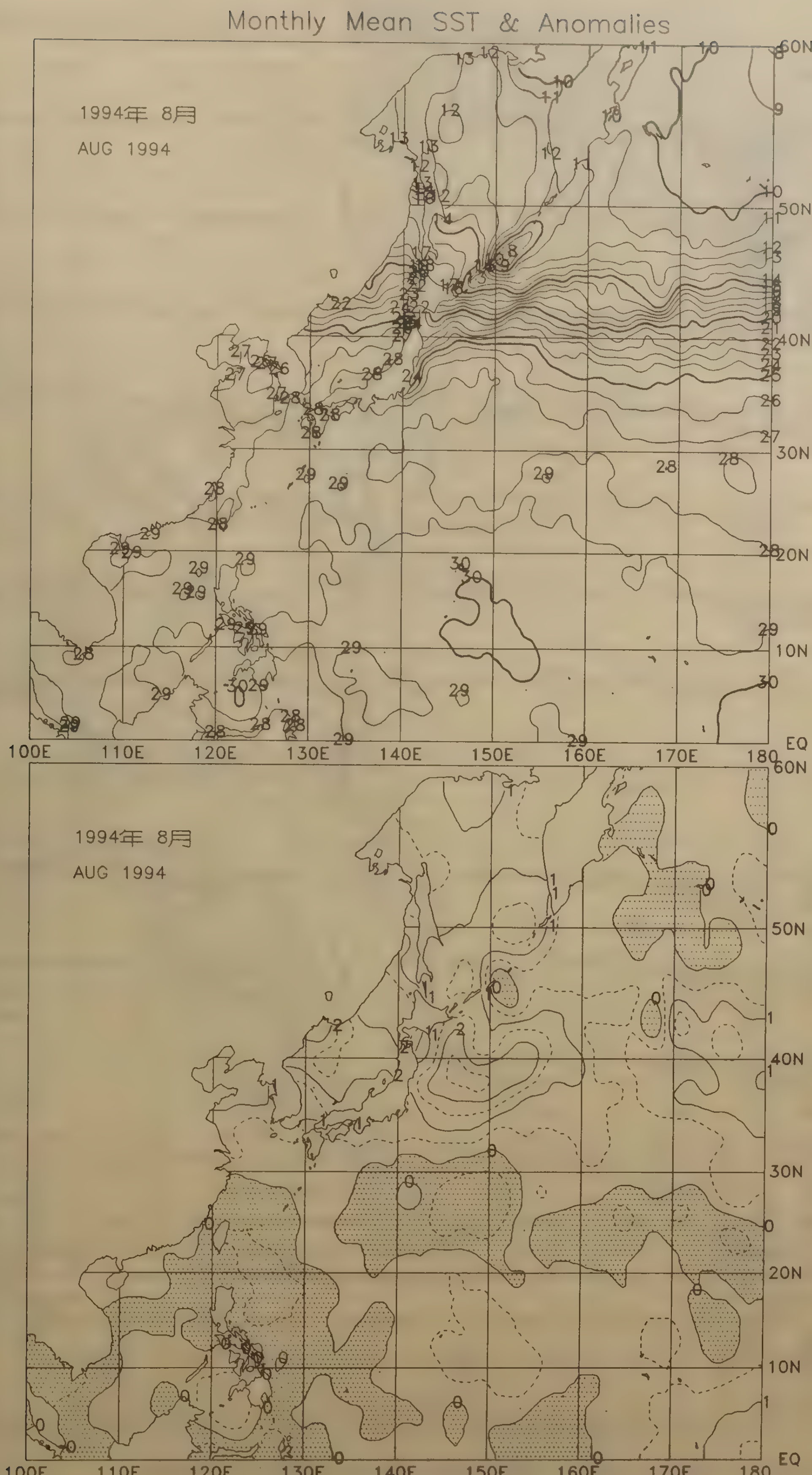
地 名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	28.2	−0.6
那 覇(47936)	28.1	+0.4
名 瀬(47909)	−	−
足摺岬(47898)	28.2	+1.0
潮 岬(47778)	28.9	−
御前崎(47655)	27.8	+1.8
八丈島(47678)	27.2	+0.2
館 山(47672)	25.2	+1.0
小名浜(47598)	22.7	+0.5
宮 古(47585)	20.8	+0.9
浦 河(47426)	19.7	+0.8
紋 別(47435)	20.2	−
稚 内(47401)	21.9	−
寿 都(47421)	23.5	−
江 差(47428)	24.3	−
飛 島(47587)	27.4	+2.0
輪 島(47600)	27.9	+1.7
西 郷(47740)	28.3	−
浜 田(47755)	28.0	−
厳 原(47800)	27.5	−
牛 深(47838)	28.1	−

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	27.9
四国沖	29.0N,135.0E	27.8
東シナ海	28.2N,126.3E	28.3

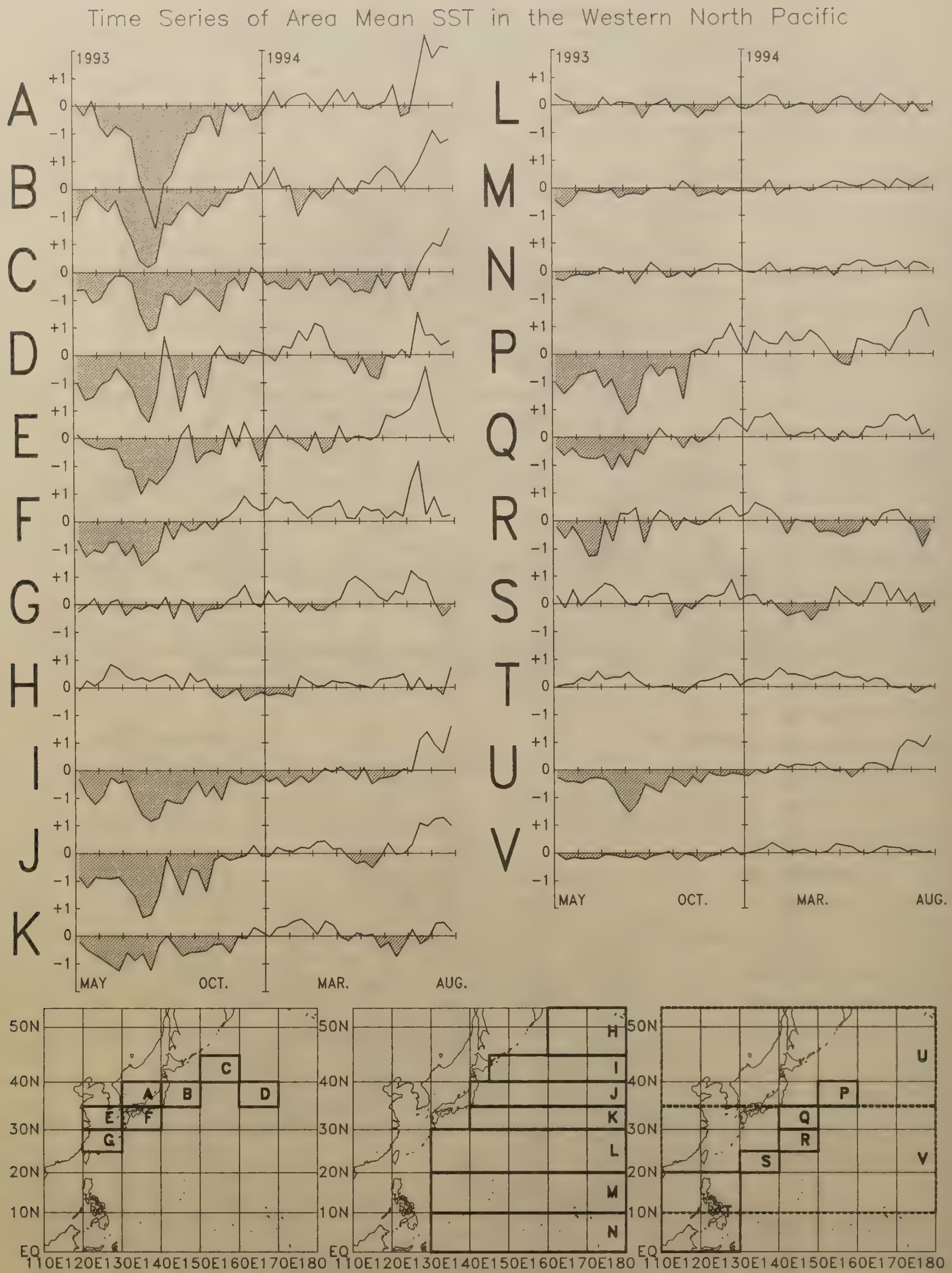
第16図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 8月下旬)

Fig.16 Ten−day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 3rd ten−day period in AUG 1994. Anomalies are computed with respect to the JMA climatology (1961−90). The contour interval is 1°C and additional anomaly contours of 0.5°C are shown. Negative anomalies are stippled.



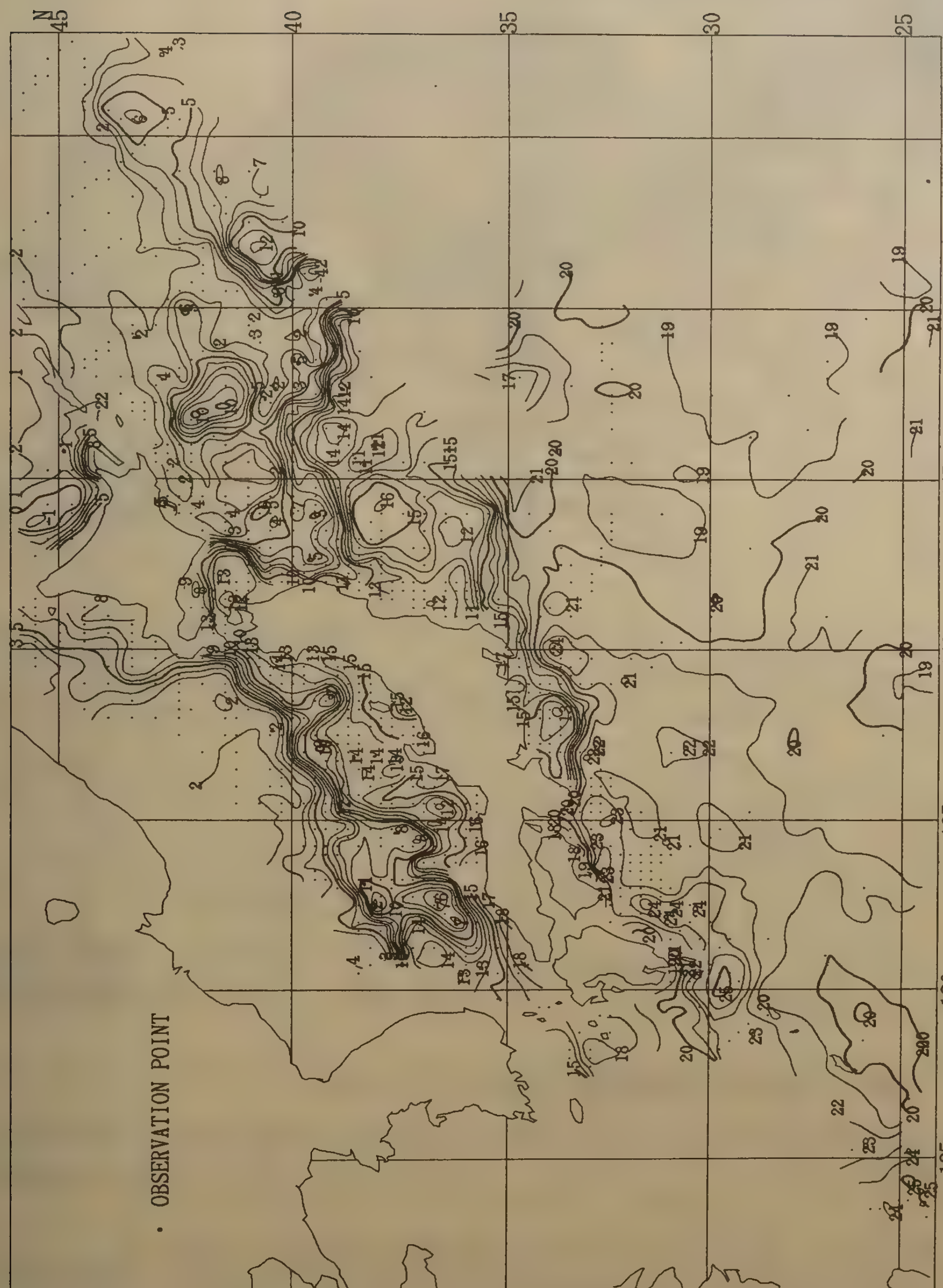
第17図 北西太平洋月平均海面水温図(上)及び偏差図(下)(1994年 8月)

Fig.17 Monthly mean SSTs in the western North Pacific (top) and anomalies (bottom) for AUG 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.



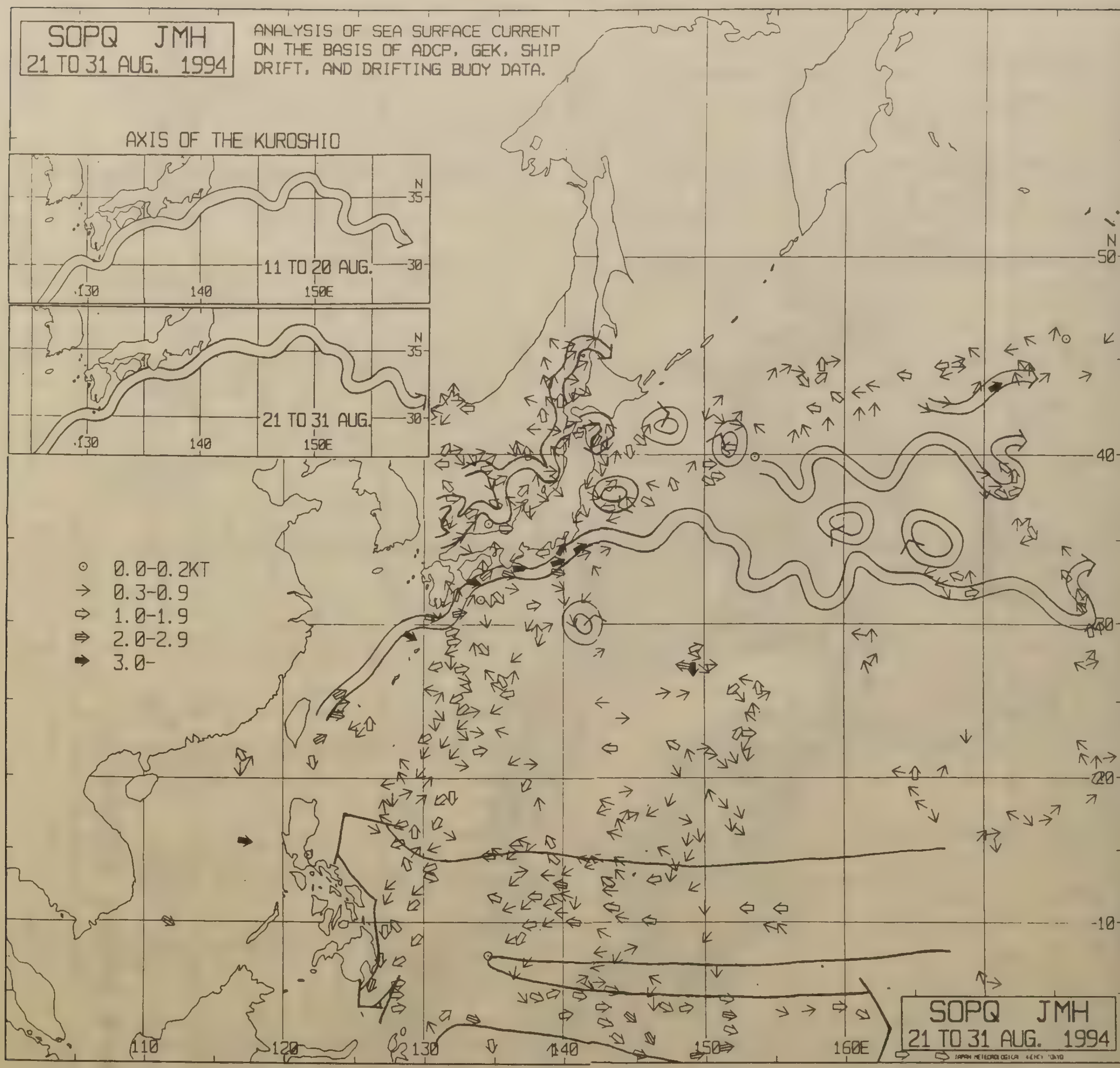
第18図　北西太平洋旬平均海面水温平年偏差時系列図

Fig.18 Time series of the ten-day mean sea surface temperature anomalies (° C) in the western North Pacific for the areas indicated at the bottom. Negative anomalies are shaded. Anomalies are computed with respect to the JMA climatology (1961-90).



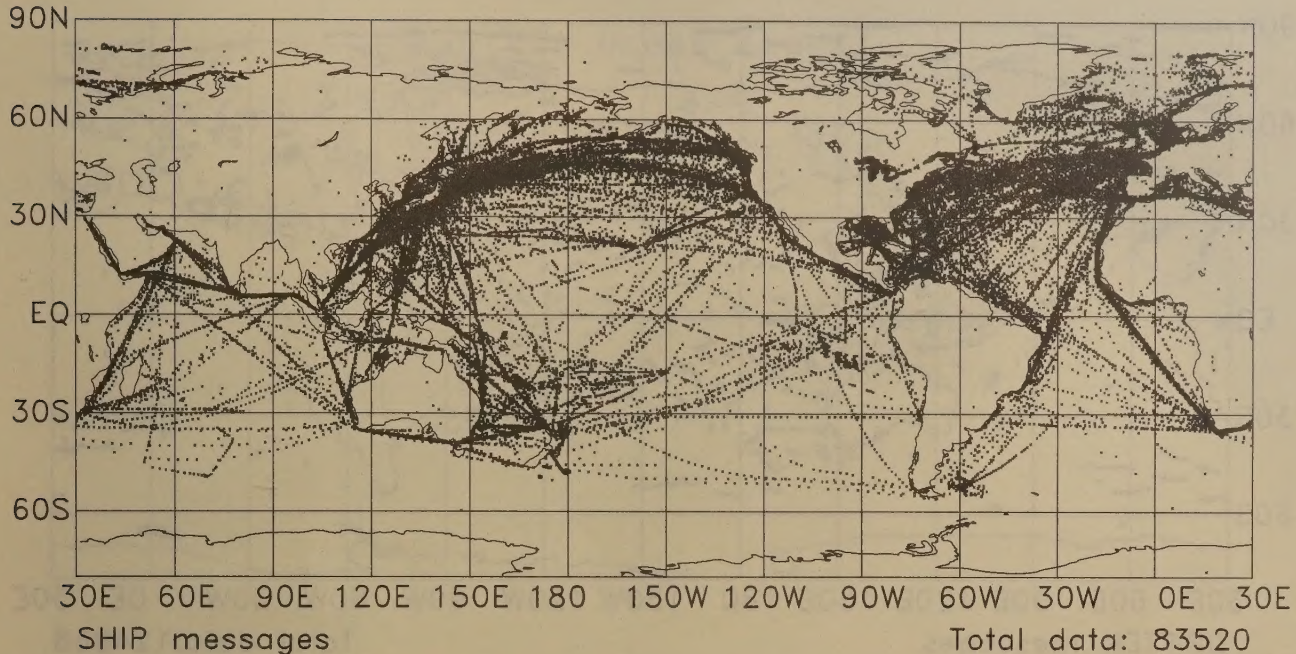
第19図　日本近海表層水温（深さ100M）図（1994年 8月）

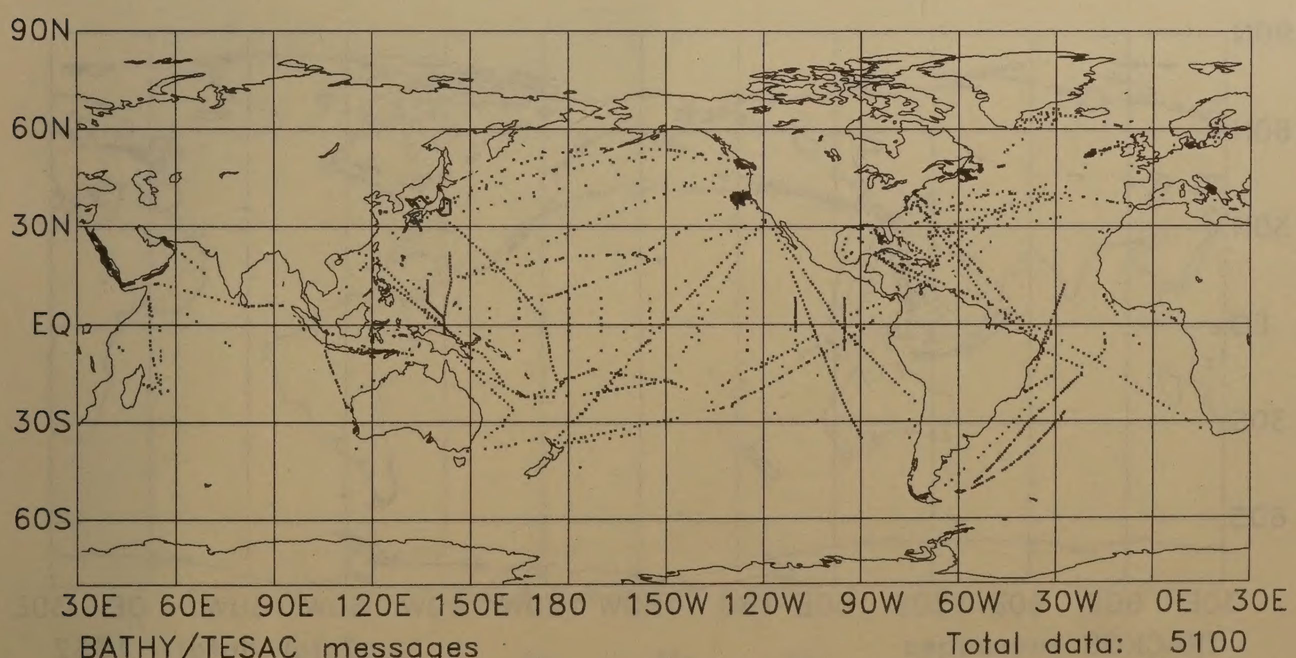
Fig.19　Subsurface (100m) temperatures in seas adjacent to Japan for AUG 1994.



第20図　北西太平洋旬平均海流図（1994年 8月下旬）

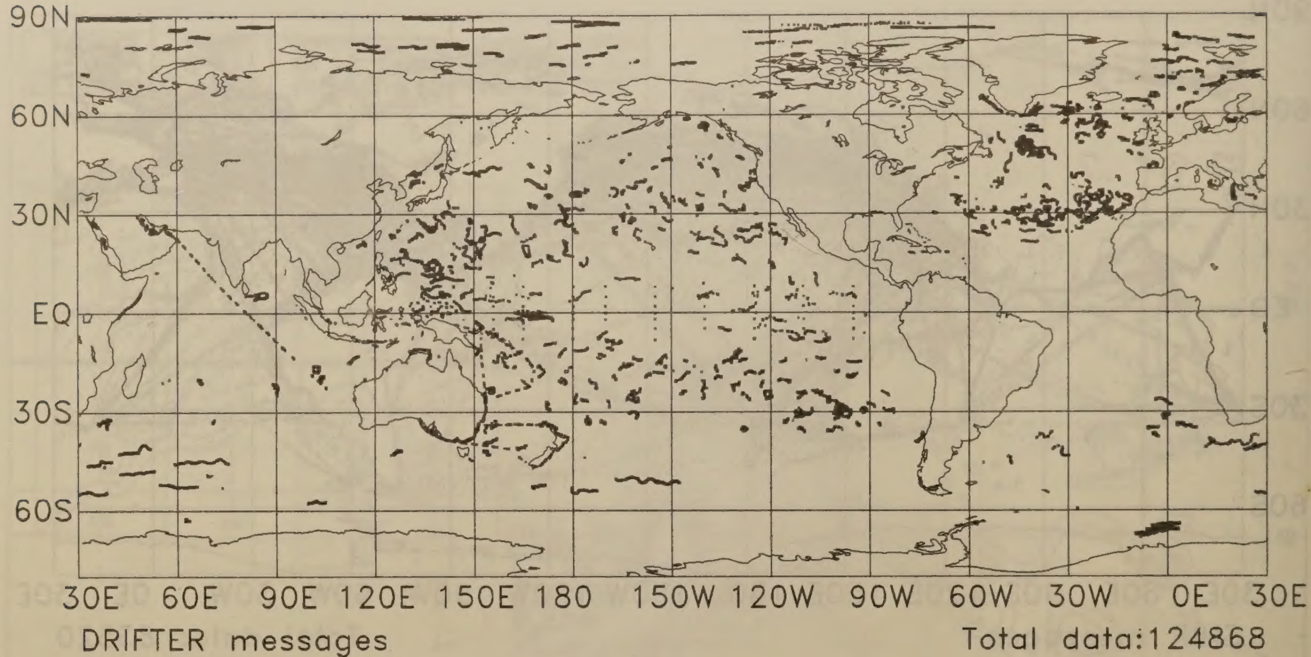
Fig.20 Ten-day analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in AUG 1994. Small arrows indicate sea surface currents measured with acoustic Doppler current profilers, GEKs deployed in research vessels, and ship drift by merchant ships/drifting buoys during the month. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

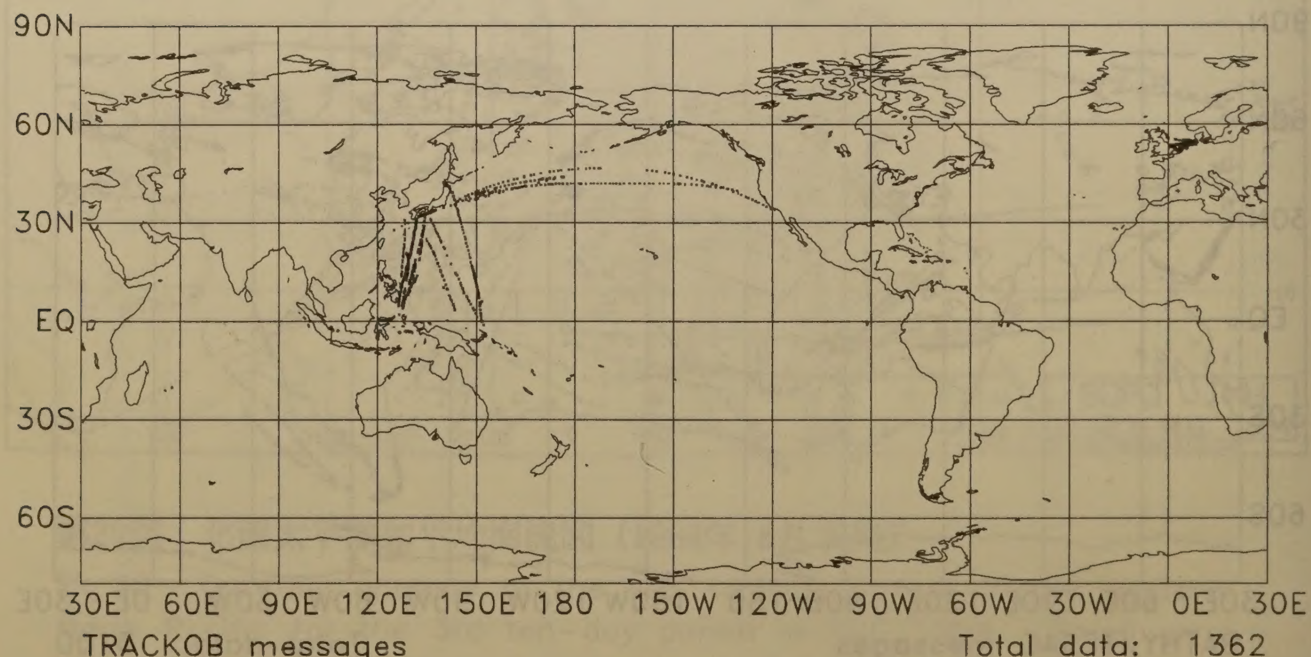




第21-1図 測点分布図(1994年 8月)

Fig.21−1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for AUG 1994.





第21-2図　測点分布図(1994年 8月)

Fig.21-2 Geographical distribution of DRIFTER messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for AUG 1994.

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